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| Val Ala Leu Asn Asp Ile Lys Arg Leu Thr Pro Asn Tyr Thr Leu Cly Asn Tyr Val Phe Ala Ile Asp Leu Asp Leu Asp Leu Asp Asp Leu Asp Arg A | Leu | Val | Val | | Gly | Thr | Leu | Pro | | Phe | Asn | Leu | Thr | | Asp | Gly |
| Ala Asn Gly Tyr Val Phe S55 Ala Ile Asp Leu Asn Gly Tyr Val S50 Phe S50 Ala Ile Asp Leu Asn Gly S55 Tyr Val Leu Leu S60 Leu Asp S60 Tyr Val Leu Leu S60 Tyr S60 | Pro | Gly | | Lys | Lys | Asn | Gln | | Ile | Leu | Gly | Val | | Gly | Ile | Asp |
| 545 550 555 566 His Pro Asn Leu Lys 565 Pro Gln Thr Thr Asn 570 Phe Arg Glu Pro Glu Pro 575 Val Thr 575 Leu Asp Phe Leu Sso 580 Asp Glu Leu Glu Asp Glu Asp Glu Asp Glu Asp Sso 585 Phe Arg Glu Asp Sso 590 Thr 586 Arg Arg Ser Met Ile Asp Gly Asn Lys Gly His Lys Gln Ile Arg Thr | Val | | Leu | Asn | Asp | Ile | | Arg | Leu | Thr | Pro | | Tyr | Thr | Leu | Gly |
| Leu Asp Phe Leu Asp Ala Glu Leu Glu Asp Glu Asn Lys Glu Glu Glu Ile 580 Arg Arg Ser Met Ile Asp Gly Asn Lys Gly His Lys Gln Ile Arg Th | | | Gly | Tyr | Val | | Ala | Ile | Asp | Leu | | Gly | Tyr | Val | Leu | Leu 560 |
| 580 585 590 Arg Arg Ser Met Ile Asp Gly Asn Lys Gly His Lys Gln Ile Arg Th | His | Pro | Asn | Leu | | Pro | Gln | Thr | Thr | | Phe | Arg | Glu | Pro | | Thr |
| | Leu | Asp | Phe | | Asp | Ala | Glu | Leu | | Asp | Glu | Asn | Lys | | Glu | Ile |
| | Arg | Arg | | Met | Ile | Asp | Gly | | Lys | Gly | His | Lys | | Ile | Arg | Thr |

Leu Val Lys Ser Leu Asp Glu Arg Tyr Ile Asp Glu Val Thr Arg Asn

| 610 | 615 | 620 |
|-----|-----|-----|
| | | |

| Tyr 625 | Thr | Trp | Val | Pro | Ile 630 | Arg | Ser | Thr | Asn | Tyr 635 | Ser | Leu | Gly | Leu | Val 640 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Leu | Pro | Pro | Tyr | Ser 645 | Thr | Phe | Tyr | Leu | Gln 650 | Ala | Asn | Leu | Ser | Asp 655 | Gln |
| Ile | Leu | Gln | Val 660 | Lys | Tyr | Phe | Glu | Phe 665 | Leu | Leu | Pro | Ser | Ser 670 | Phe | Glu |
| Ser | Glu | Gly 675 | His | Val | Phe | Ile | Ala 680 | Pro | Arg | Glu | Tyr | Cys 685 | Lys | Asp | Leu |
| Asn | Ala 690 | Ser | Asp | Asn | Asn | Thr 695 | Glu | Phe | Leu | Lys | Asn 700 | Phe | Ile | Glu | Leu |
| Met 705 | Glu | Lys | Val | Thr | Pro 710 | Asp | Ser | Lys | Gln | Cys 715 | Asn | Asn | Phe | Leu | 120 |
| His | Asn | Leu | Ile | Leu 725 | Asp | Thr | Gly | Ile | Thr 730 | Gln | Gln | Leu | Val | Glu 735 | Arg |
| Val | Trp | Arg | Asp 740 | Gln | Asp | Leu | Asn | Thr 745 | Tyr | Ser | Leu | Leu | Ala 750 | Val | Phe |
| Ala | Ala | Thr 755 | Asp | Gly | Gly | Ile | Thr 760 | Arg | Val | Phe | Pro | Asn 765 | Lys | Ala | Ala |
| Glu | Asp 770 | Trp | Thr | Glu | Asn | Pro 775 | Glu | Pro | Phe | Asn | Ala 780 | Ser | Phe | Tyr | Arg |
| Arg 785 | Ser | Leu | Asp | Asn | His 790 | Gly | Tyr | Val | Phe | Lys 795 | Pro | Pro | His | Gln | Asp 800 |
| Ala | Leu | Leu | Arg | Pro 805 | Leu | Glu | Leu | Glu | Asn 810 | Asp | Thr | Val | Gly | Ile 815 | Lev |
| Val | Ser | Thr | Ala 820 | Val | Glu | Leu | Ser | Leu 825 | Gly | Arg | Arg | Thr | Leu 830 | Arg | Pro |
| Ala | Val | Val 835 | Gly | Val | Lys | Leu | Asp 840 | Leu | Glu | Ala | Trp | Ala 845 | Glu | Lys | Ph€ |
| Lys | Val 850 | Leu | Ala | Ser | Asn | Arg 855 | Thr | His | Gln | Asp | Gln 860 | Pro | Gln | Lys | Cys |

Gly Pro Asn Ser His Cys Glu Met Asp Cys Glu Val Asn Asn Glu Asp

Leu Leu Cys Val Leu Ile Asp Asp Gly Gly Phe Leu Val Leu Ser Asn 885 890 895

Gln Asn His Gln Trp Asp Gln Val Gly Arg Phe Phe Ser Glu Val Asp 900 905 910

Ala Asn Leu Met Leu Ala Leu Tyr Asn Asn Ser Phe Tyr Thr Arg Lys 915 920 925

Glu Ser Tyr Asp Tyr Gln Ala Ala Cys Ala Pro Gln Pro Pro Gly Asn 930 935 940

Leu Gly Ala Ala Pro Arg Gly Val Phe Val Pro Thr Val Ala Asp Phe 945 950 955 960

Leu Asn Leu Ala Trp Trp Thr Ser Ala Ala Ala Trp Ser Leu Phe Gln 965 970 975

Gln Leu Leu Tyr Gly Leu Ile Tyr His Ser Trp Phe Gln Ala Asp Pro 980 985 990

Ala Glu Ala Glu Gly Ser Pro Glu Thr Arg Glu Ser Ser Cys Val Met 995 1000 1005

Lys Gln Thr Gln Tyr Tyr Phe Gly Ser Val Asn Ala Ser Tyr Asn Ala 1010 1015 1020

Ile Ile Asp Cys Gly Asn Cys Ser Arg Leu Phe His Ala Gln Arg Leu 1025 1030 1035 1040

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| Thr | Arg | Arg 35 | Pro | Thr | Ser | Gly | Pro 40 | Pro | Arg | Pro | Leu | Trp 45 | Leu | Leu | Leu |
| Pro | Leu 50 | Leu | Pro | Leu | Leu | Ala 55 | Ala | Pro | Gly | Ala | Ser 60 | Ala | Tyr | Ser | Phe |
| Pro 65 | Gln | Gln | His | Thr | Met 70 | Gln | His | Trp | Ala | Arg 75 | Arg | Leu | Glu | Gln | Glu 80 |
| Val | Asp | Gly | Val | Met 85 | Arg | Ile | Phe | Gly | Gly 90 | Val | Gln | Gln | Leu | Arg 95 | Glu |
| Ile | Tyr | Lys | Asp 100 | Asn | Arg | Asn | Leu | Phe 105 | Glu | Val | Gln | Glu | Asn 110 | Glu | Pro |
| Gln | Lys | Leu 115 | Val | Glu | Lys | Val | Ala 120 | Gly | Asp | Ile | Glu | Ser 125 | Leu | Leu | Asp |
| Arg | Lys 130 | Val | Gln | Ala | Leu | Lys 135 | Arg | Leu | Ala | Asp | Ala 140 | Ala | Glu | Asn | Phe |
| Gln 145 | Lys | Ala | His | Arg | Trp 150 | Gln | Asp | Asn | Ile | Lys 155 | Glu | Glu | Asp | Ile | Val 160 |
| Tyr | Tyr | Asp | Ala | Lys 165 | Ala | Asp | Ala | Glu | Leu 170 | Asp | Asp | Pro | Glu | Ser 175 | Glu |
| Asp | Val | Glu | Arg 180 | Gly | Ser | Lys | Ala | Ser 185 | Thr | Leu | Arg | Leu | Asp 190 | Phe | Ile |
| Glu | Asp | Pro 195 | Asn | Phe | Lys | Asn | Lys 200 | Val | Asn | Tyr | Ser | Tyr 205 | Ala | Ala | Val |
| Gln | Ile 210 | Pro | Thr | Asp | Ile | Tyr 215 | Lys | Gly | Ser | Thr | Val 220 | Ile | Leu | Asn | Glu |
| Leu 225 | Asn | Trp | Thr | Glu | Ala 230 | Leu | Glu | Asn | Val | Phe 235 | Met | Glu | Asn | Arg | Arg 240 |
| Gln | Asp | Pro | Thr | Leu 245 | Leu | Trp | Gln | Val | Phe 250 | Gly | Ser | Ala | Thr | Gly 255 | Val |
| Thr | Arg | Tyr | Tyr 260 | Pro | Ala | Thr | Pro | Trp 265 | Arg | Ala | Pro | Lys | Lys 270 | Ile | Asp |

Leu Tyr Asp Val Arg Arg Pro Trp Tyr Ile Gln Gly Ala Ser Ser Pro Lys Asp Met Val Ile Ile Val Asp Val Ser Gly Ser Val Ser Gly Leu Thr Leu Lys Leu Met Lys Thr Ser Val Cys Glu Met Leu Asp Thr Leu Ser Asp Asp Asp Tyr Val Asn Val Ala Ser Phe Asn Glu Lys Ala Gln Pro Val Ser Cys Phe Thr His Leu Val Gln Ala Asn Val Arg Asn Lys Lys Val Phe Lys Glu Ala Val Gln Gly Met Val Ala Lys Gly Thr Thr Gly Tyr Lys Ala Gly Phe Glu Tyr Ala Phe Asp Gln Leu Gln Asn Ser Asn Ile Thr Arg Ala Asn Cys Asn Lys Met Ile Met Met Phe Thr Asp Gly Gly Glu Asp Arq Val Gln Asp Val Phe Glu Lys Tyr Asn Trp Pro Asn Arg Thr Val Arg Val Phe Thr Phe Ser Val Gly Gln His Asn Tyr Asp Val Thr Pro Leu Gln Trp Met Ala Cys Ala Asn Lys Gly Tyr Tyr Phe Glu Ile Pro Ser Ile Gly Ala Ile Arg Ile Asn Thr Gln Glu Tyr Leu Asp Val Leu Gly Arg Pro Met Val Leu Ala Gly Lys Glu Ala Lys Gln Val Gln Trp Thr Asn Val Tyr Glu Asp Ala Leu Gly Leu Gly Leu Val Val Thr Gly Thr Leu Pro Val Phe Asn Leu Thr Gln Asp Gly Pro Gly Glu Lys Lys Asn Gln Leu Ile Leu Gly Val Met Gly Ile Asp

| Val | Ala 530 | Leu | Asn | Asp | Ile | Lys 535 | Arg | Leu | Thr | Pro | Asn 540 | Tyr | Thr | Leu | Gly |
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| Ala 545 | Asn | Gly | Tyr | Val | Phe 550 | Ala | Ile | Asp | Leu | Asn 555 | Gly | Tyr | Val | Leu | Leu 560 |
| His | Pro | Asn | Leu | Lys 565 | Pro | Gln | Thr | Thr | Asn 570 | Phe | Arg | Glu | Pro | Val 575 | Thr |
| Leu | Asp | Phe | Leu 580 | Asp | Ala | Glu | Leu | Glu 585 | Asp | Glu | Asn | Lys | Glu 590 | Glu | Ile |
| Arg | Arg | Ser 595 | Met | Ile | Asp | Gly | Asn 600 | Lys | Gly | His | Lys | Gln 605 | Ile | Arg | Thr |
| Leu | Val 610 | Lys | Ser | Leu | Asp | Glu 615 | Arg | Tyr | Ile | Asp | Glu 620 | Val | Thr | Arg | Asn |
| Tyr 625 | Thr | Trp | Val | Pro | Ile 630 | Arg | Ser | Thr | Asn | Tyr 635 | Ser | Leu | Gly | Leu | Val 640 |
| Leu | Pro | Pro | Tyr | Ser 645 | Thr | Phe | Tyr | Leu | Gln 650 | Ala | Asn | Leu | Ser | Asp 655 | Gln |
| Ile | Leu | Gln | Val 660 | Lys | Tyr | Phe | Glu | Phe 665 | Leu | Leu | Pro | Ser | Ser 670 | Phe | Glu |
| Ser | Glu | Gly 675 | His | Val | Phe | Ile | Ala 680 | Pro | Arg | Glu | Tyr | Cys 685 | Lys | Asp | Leu |
| Asn | Ala 690 | Ser | Asp | Asn | Asn | Thr 695 | Glu | Phe | Leu | Lys | Asn 700 | Phe | Ile | Glu | Leu |
| Met 705 | Glu | Lys | Val | Thr | Pro 710 | Asp | Ser | Lys | Gln | Cys 715 | Asn | Asn | Phe | Leu | Leu 720 |
| His | Asn | Leu | Ile | Leu 725 | Asp | Thr | Gly | Ile | Thr 730 | Gln | Gln | Leu | Val | Glu 735 | Arg |
| Val | Trp | Arg | Asp 740 | Gln | Asp | Leu | Asn | Thr 745 | Tyr | Ser | Leu | Leu | Ala 750 | Val | Phe |
| Ala | Ala | Thr 755 | Asp | Gly | Gly | Ile | Thr 760 | Arg | Val | Phe | Pro | Asn 765 | Lys | Ala | Ala |
| Glu | Asp | Trp | Thr | Glu | Asn | Pro | Glu | Pro | Phe | Asn | Ala | | Phe | Tyr | Arg |

| 785 | Ser | Leu | Asp | Asn | 790 | GIY | Tyr | vai | Pne | 195 | Pro | Pro | HIS | GIN | 800 |
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| Ala | Leu | Leu | Arg | Pro 805 | Leu | Glu | Leu | Glu | Asn 810 | Asp | Thr | Val | Gly | Ile 815 | Leu |
| Val | Ser | Thr | Ala 820 | Val | Glu | Leu | Ser | Leu 825 | Gly | Arg | Arg | Thr | Leu 830 | Arg | Pro |
| Ala | Val | Val 835 | Gly | Val | Lys | Leu | Asp 840 | Leu | Glu | Ala | Trp | Ala 845 | Glu | Lys | Phe |
| Lys | Val 850 | Leu | Ala | Ser | Asn | Arg 855 | Thr | His | Gln | Asp | Gln 860 | Pro | Gln | Lys | Cys |
| 865 | | | | | 870 | | | | | 875 | | , | Asn | | 880 |
| | | - | | 885 | | _ | | _ | 890 | | | | Leu | 895 | |
| | | | 900 | _ | _ | | | 905 | | | | | Glu 910 | | |
| | | 915 | | | | | 920 | | | | | 925 | Thr | | |
| | 930 | - | | | | 935 | | | | | 940 | | Pro | | |
| 945 | _ | | | | 950 | _ | | | | 955 | | | Ala | | 960 |
| | | | | 965 | | | | | 970 | | | | Leu | 975 | |
| | | | 980 | | | | | 985 | | | | | Ala 990 | | |
| | | 995 | | | | | 1000 | | | | | 1005 | Cys | | |
| | 1010 | | | | | 1015 | | | | | 1020 | | Tyr | | |
| Ile 1025 | | Asp | Cys | | Asn 1030 | Cys | Ser | Arg | | Phe 1035 | His | Ala | Gln | | Leu 1040 |

Thr Asn Thr Asn Leu Leu Phe Val Val Ala Glu Lys Pro Leu Cys Ser 1045 1050 1055

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Pro Leu Leu Pro Leu Leu Ala Ala Pro Gly Ala Ser Ala Tyr Ser Phe 50 55 60

Pro Gln Gln His Thr Met Gln His Trp Ala Arg Arg Leu Glu Gln Glu 65 70 75 80

Val Asp Gly Val Met Arg Ile Phe Gly Gly Val Gln Gln Leu Arg Glu 85 90 95

Ile Tyr Lys Asp Asn Arg Asn Leu Phe Glu Val Gln Glu Asn Glu Pro
100 105 110

Gln Lys Leu Val Glu Lys Val Ala Gly Asp Ile Glu Ser Leu Leu Asp 115 120 125 .

Arg Lys Val Gln Ala Leu Lys Arg Leu Ala Asp Ala Ala Glu Asn Phe 130 135 140

Gln Lys Ala His Arg Trp Gln Asp Asn Ile Lys Glu Glu Asp Ile Val 145 150 155 160

Tyr Tyr Asp Ala Lys Ala Asp Ala Glu Leu Asp Asp Pro Glu Ser Glu 165 170 175

Asp Val Glu Arq Gly Ser Lys Ala Ser Thr Leu Arg Leu Asp Phe Ile Glu Asp Pro Asn Phe Lys Asn Lys Val Asn Tyr Ser Tyr Ala Ala Val Gln Ile Pro Thr Asp Ile Tyr Lys Gly Ser Thr Val Ile Leu Asn Glu Leu Asn Trp Thr Glu Ala Leu Glu Asn Val Phe Met Glu Asn Arg Arg Gln Asp Pro Thr Leu Leu Trp Gln Val Phe Gly Ser Ala Thr Gly Val Thr Arg Tyr Tyr Pro Ala Thr Pro Trp Arg Ala Pro Lys Lys Ile Asp Leu Tyr Asp Val Arg Arg Pro Trp Tyr Ile Gln Gly Ala Ser Ser Pro Lys Asp Met Val Ile Ile Val Asp Val Ser Gly Ser Val Ser Gly Leu Thr Leu Lys Leu Met Lys Thr Ser Val Cys Glu Met Leu Asp Thr Leu Ser Asp Asp Asp Tyr Val Asn Val Ala Ser Phe Asn Glu Lys Ala Gln Pro Val Ser Cys Phe Thr His Leu Val Gln Ala Asn Val Arg Asn Lys Lys Val Phe Lys Glu Ala Val Gln Gly Met Val Ala Lys Gly Thr Thr Gly Tyr Lys Ala Gly Phe Glu Tyr Ala Phe Asp Gln Leu Gln Asn Ser Asn Ile Thr Arg Ala Asn Cys Asn Lys Met Ile Met Met Phe Thr Asp Gly Glu Asp Arg Val Gln Asp Val Phe Glu Lys Tyr Asn Trp Pro Asn Arg Thr Val Arg Val Phe Thr Phe Ser Val Gly Gln His Asn

Tyr Asp Val Thr Pro Leu Gln Trp Met Ala Cys Ala Asn Lys Gly Tyr Tyr Phe Glu Ile Pro Ser Ile Gly Ala Ile Arg Ile Asn Thr Gln Glu Tyr Leu Asp Val Leu Gly Arg Pro Met Val Leu Ala Gly Lys Glu Ala Lys Gln Val Gln Trp Thr Asn Val Tyr Glu Asp Ala Leu Gly Leu Gly Leu Val Val Thr Gly Thr Leu Pro Val Phe Asn Leu Thr Gln Asp Gly Pro Gly Glu Lys Lys Asn Gln Leu Ile Leu Gly Val Met Gly Ile Asp Val Ala Leu Asn Asp Ile Lys Arg Leu Thr Pro Asn Tyr Thr Leu Gly Ala Asn Gly Tyr Val Phe Ala Ile Asp Leu Asn Gly Tyr Val Leu Leu His Pro Asn Leu Lys Pro Gln Thr Thr Asn Phe Arg Glu Pro Val Thr Leu Asp Phe Leu Asp Ala Glu Leu Glu Asp Glu Asn Lys Glu Glu Ile Arg Arg Ser Met Ile Asp Gly Asn Lys Gly His Lys Gln Ile Arg Thr Leu Val Lys Ser Leu Asp Glu Arg Tyr Ile Asp Glu Val Thr Arg Asn Tyr Thr Trp Val Pro Ile Arg Ser Thr Asn Tyr Ser Leu Gly Leu Val Leu Pro Pro Tyr Ser Thr Phe Tyr Leu Gln Ala Asn Leu Ser Asp Gln Ile Leu Gln Val Lys Tyr Phe Glu Phe Leu Leu Pro Ser Ser Phe Glu Ser Glu Gly His Val Phe Ile Ala Pro Arg Glu Tyr Cys Lys Asp Leu

Asn Ala Ser Asp Asn Asn Thr Glu Phe Leu Lys Asn Phe Ile Glu Leu Met Glu Lys Val Thr Pro Asp Ser Lys Gln Cys Asn Asn Phe Leu Leu His Asn Leu Ile Leu Asp Thr Gly Ile Thr Gln Gln Leu Val Glu Arg Val Trp Arq Asp Gln Asp Leu Asn Thr Tyr Ser Leu Leu Ala Val Phe Ala Ala Thr Asp Gly Gly Ile Thr Arg Val Phe Pro Asn Lys Ala Ala Glu Asp Trp Thr Glu Asn Pro Glu Pro Phe Asn Ala Ser Phe Tyr Arg Arg Ser Leu Asp Asn His Gly Tyr Val Phe Lys Pro Pro His Gln Asp Ala Leu Leu Arg Pro Leu Glu Leu Glu Asn Asp Thr Val Gly Ile Leu Val Ser Thr Ala Val Glu Leu Ser Leu Gly Arg Arg Thr Leu Arg Pro Ala Val Val Gly Val Lys Leu Asp Leu Glu Ala Trp Ala Glu Lys Phe Lys Val Leu Ala Ser Asn Arg Thr His Gln Asp Gln Pro Gln Lys Cys Gly Pro Asn Ser His Cys Glu Met Asp Cys Glu Val Asn Asn Glu Asp Leu Leu Cys Val Leu Ile Asp Asp Gly Gly Phe Leu Val Leu Ser Asn Gln Asn His Gln Trp Asp Gln Val Gly Arg Phe Phe Ser Glu Val Asp Ala Asn Leu Met Leu Ala Leu Tyr Asn Asn Ser Phe Tyr Thr Arg Lys Glu Ser Tyr Asp Tyr Gln Ala Ala Cys Ala Pro Gln Pro Pro Gly Asn

Leu Gly Ala Ala Pro Arg Gly Val Phe Val Pro Thr Val Ala Asp Phe 945 950 955 960

Leu Asn Leu Ala Trp Trp Thr Ser Ala Ala Ala Trp Ser Leu Phe Gln 965 970 975

Gln Leu Leu Tyr Gly Leu Ile Tyr His Ser Trp Phe Gln Ala Asp Pro 980 985 990

Ala Glu Ala Glu Gly Ser Pro Glu Thr Arg Glu Ser Ser Cys Val Met 995 1000 1005

Lys Gln Thr Gln Tyr Tyr Phe Gly Ser Val Asn Ala Ser Tyr Asn Ala 1010 1015 1020

Ile Ile Asp Cys Gly Asn Cys Ser Arg Leu Phe His Ala Gln Arg Leu 1025 1030 1035 1040

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Gln Cys Glu Ala Gly Arg Leu Leu Gln Lys Glu Thr His Cys Pro Ala 1060 1065 1070

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Leu Leu Gln Lys Lys Tyr Lys Glu Tyr Glu Lys Asp Val Ala Ile Glu 65 70 75 80

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| Glu | Tyr 130 | Phe | Asn | Ala | Val | Leu 135 | Ile | Asn | Glu | Arg | Asp 140 | Lys | Asp | Gly | Asn |
| Phe 145 | Leu | Glu | Leu | Gly | Lys 150 | Glu | Phe | Ile | Leu | Ala 155 | Pro | Asn | Asp | His | Phe 160 |
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| Glu | Ser | Leu 195 | Asn | Lys | Val | Phe | Val 200 | Asp | Asn | Phe | Asp | Arg 205 | Asp | Pro | Ser |
| Leu | Ile 210 | Trp | Gln | Tyr | Phe | Gly 215 | Ser | Ala | Lys | Gly | Phe 220 | Phe | Arg | Gln | Tyr |
| Pro 225 | Gly | Ile | Lys | Trp | Glu 230 | Pro | Asp | Glu | Asn | Gly 235 | Val | Ile | Ala | Phe | Asp 240 |
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| Thr | Ile | Ala 275 | Lys | Gln | Thr | Val | Ser 280 | Ser | Ile | Leu | Asp | Thr 285 | Leu | Gly | Asp |
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| Glu 305 | Pro | Cys | Leu | Asn | Gly 310 | Thr | Leu | Val | Gln | Ala 315 | Asp | Arg | Thr | As'n | Lys 320 |
| Glu | His | Phe | Arg | Glu 325 | His | Leu | Asp | Lys | Leu 330 | Phe | Ala | Lys | Gly | Ile 335 | Gly |
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Asn His Thr Gly Gln Gly Ser Ile Cys Ser Gln Ala Ile Met Leu Ile Thr Asp Gly Ala Val Asp Thr Tyr Asp Thr Ile Phe Ala Lys Tyr Asn Trp Pro Asp Arg Lys Val Arg Ile Phe Thr Tyr Leu Ile Gly Arg Glu Ala Ala Phe Ala Asp Asn Leu Lys Trp Met Ala Cys Ala Asn Lys Gly Phe Phe Thr Gln Ile Ser Thr Leu Ala Asp Val Gln Glu Asn Val Met Glu Tyr Leu His Val Leu Ser Arg Pro Lys Val Ile Asp Gln Glu His Asp Val Val Trp Thr Glu Ala Tyr Ile Asp Ser Thr Leu Thr Asp Asp Gln Gly Pro Val Leu Met Thr Thr Val Ala Met Pro Val Phe Ser Lys Gln Asn Glu Thr Arg Ser Lys Gly Ile Leu Leu Gly Val Val Gly Thr Asp Val Pro Val Lys Glu Leu Leu Lys Thr Ile Pro Lys Tyr Lys Leu Gly Ile His Gly Tyr Ala Phe Ala Ile Thr Asn Asn Gly Tyr Ile Leu Thr His Pro Glu Leu Arg Leu Leu Tyr Glu Glu Gly Lys Lys Arg Arg Lys Pro Asn Tyr Ser Ser Val Asp Leu Ser Glu Val Glu Trp Glu Asp Arg Asp Asp Val Leu Arg Asn Ala Met Val Asn Arg Lys Thr Gly Lys Phe Ser Met Glu Val Lys Lys Thr Val Asp Lys Gly Lys Arg Val Leu Val Met Thr Asn Asp Tyr Tyr Tyr Thr Asp Ile Lys Gly Thr Pro Phe

| Ser | Leu 610 | Gly | Val | Ala | Leu | Ser 615 | Arg | Gly | His | Gly | Lys 620 | Tyr | Phe | Phe | Arg |
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| Gly 625 | Asn | Val | Thr | Ile | Glu 630 | Glu | Gly | Leu | His | Asp 635 | Leu | Glu | His | Pro | Asp 640 |
| Val | Ser | Leu | Ala | Asp 645 | Glu | Trp | Ser | Tyr | Cys 650 | Asn | Thr | Asp | Leu | His 655 | Pro |
| Glu | His | Arg | His 660 | Leu | Ser | Gln | | Glu 665 | Ala | Ile | Lys | Leu | Tyr 670 | Leu | Lys |
| Gly | Lys | Glu 675 | Pro | Leu | Leu | Gln | Cys 680 | Asp | Lys | Glu | Leu | Ile 685 | Gln | Glu | Val |
| Leu | Phe 690 | Asp | Ala | Val | Val | Ser 695 | Ala | Pro | Ile | Glu | Ala 700 | Tyr | Trp | Thr | Ser |
| Leu 705 | Ala | Leu | Asn | Lys | Ser 710 | Glu | Asn | Ser | Asp | Lys 715 | Gly | Val | Glu | Val | Ala 720 |
| Phe | Leu | Gly | Thr | Arg 725 | Thr | Gly | Leu | Ser | Arg 730 | Ile | Asn | Leu | Phe | Val 735 | Gly |
| Ala | Glu | Gln | Leu 740 | Thr | Asn | Gln | Asp | Phe 745 | Leu | Lys | Ala | Gly | Asp 750 | Lys | Glu |
| Asn | Ile | Phe 755 | Asn | Ala | Asp | His | Phe 760 | Pro | Leu | Trp | Tyr | Arg 765 | Arg | Ala | Ala |
| Glu | Gln 770 | Ile | Pro | Gly | Ser | Phe 775 | Val | Tyr | Ser | Ile | Pro 780 | Phe | Ser | Thr | Gly |
| Pro 785 | Val | Asn | Lys | Ser | Asn 790 | Val | Val | Thr | Ala | Ser 795 | Thr | Ser | Ile | Gln | Leu 800 |
| Leu | Asp | Glu | Arg | Lys 805 | Ser | Pro | Val | Val | Ala 810 | Ala | Val | Gly | Ile | Gln 815 | Met |
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| Ala | Ser | Leu 835 | Asp | Gly | Lys | Cys | Ser 840 | Ile | Ser | Cys | Asp | Asp 845 | Glu | Thr | Val |
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Tyr Gln Ala Met Cys Arg Ala Asn Lys Glu Ser Ser Asp Gly Ala His 900 905 910

Gly Leu Leu Asp Pro Tyr Asn Ala Phe Leu Ser Ala Val Lys Trp Ile 915 920 925

Met Thr Glu Leu Val Leu Phe Leu Val Glu Phe Asn Leu Cys Ser Trp 930 935 940

Trp His Ser Asp Met Thr Ala Lys Ala Gln Lys Leu Lys Gln Thr Leu 945 950 955 960

Glu Pro Cys Asp Thr Glu Tyr Pro Ala Phe Val Ser Glu Arg Thr Ile 965 970 975

Lys Glu Thr Thr Gly Asn Ile Ala Cys Glu Asp Cys Ser Lys Ser Phe 980 985 990

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| Leu 65 | Leu | Gln | Lys | Lys | Tyr 70 | Lys | Glu | Tyr | Glu | Lys 75 | Asp | Val | Ala | Ile | Glu 80 |
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| Glu 305 | Pro | Cys | Leu | Asn | Gly 310 | Thr | Leu | Val | Gln | Ala 315 | Asp | Arg | Thr | Asn | Lys 320 |

| Glu His | Phe Arg | Glu His | Leu | Asp | Lys | Leu 330 | Phe | Ala | Lys | Gly | Ile 335 | Gly |
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| Met Leu | Asp Ile 340 | Ala Leu | Asn | Glu | Ala 345 | Phe | Asn | Ile | Leu | Ser 350 | Asp | Phe |
| Asn His | Thr Gly 355 | Gln Gly | Ser | Ile 360 | Cys | Ser | Gln | Ala | Ile 365 | Met | Leu | Ile |
| Thr Asp 370 | Gly Ala | Val Asp | Thr 375 | Tyr | Asp | Thr | Ile | Phe 380 | Ala | Lys | Tyr | Asn |
| Trp Pro 385 | Asp Arg | Lys Val 390 | - | Ile | Phe | Thr | Tyr 395 | Leu | Ile | Gly | Arg | Glu 400 |
| Ala Ala | Phe Ala | Asp Asn 405 | Leu | Lys | Trp | Met 410 | Ala | Cys | Ala | Asn | Lys 415 | Gly |
| Phe Phe | Thr Gln 420 | Ile Ser | Thr | Leu | Ala 425 | Asp | Val | Gln | Glu | Asn 430 | Val | Met |
| Glu Tyr | Leu His 435 | Val Leu | Ser | Arg 440 | Pro | Lys | Val | Ile | Asp 445 | Gln | Glu | His |
| Asp Val 450 | Val Trp | Thr Glu | Ala 455 | Tyr | Ile | Asp | Ser | Thr 460 | Leu | Thr | Asp | Asp |
| Gln Gly 465 | Pro Val | Leu Met 470 | | Thr | Val | Ala | Met 475 | Pro | Val | Phe | Ser | Lys 480 |
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| Asp Val | Pro Val 500 | Lys Glu | Leu | Leu | Lys 505 | Thr | Ile | Pro | Lys | Tyr 510 | Lys | Leu |
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| Lys Pro 545 | Asn Tyr | Ser Ser 550 | | Asp | Leu | Ser | Glu 555 | Val | Glu | Trp | Glu | Asp 560 |
| Arg Asp | Asp Val | Leu Arg 565 | Asn | Ala | Met | Val 570 | Asn | Arg | Lys | Thr | Gly 575 | Lys |

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<213> Homo sapiens

<400> 12

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- Phe Gly Glu Ile Lys Ser Ile Ala Ala Lys Tyr Ser Gly Ser Gln 50 55 60
- Leu Leu Gln Lys Lys Tyr Lys Glu Tyr Glu Lys Asp Val Ala Ile Glu 65 70 . 75 80
- Glu Ile Asp Gly Leu Gln Leu Val Lys Lys Leu Ala Lys Asn Met Glu 85 90 95
- Glu Met Phe His Lys Lys Ser Glu Ala Val Arg Arg Leu Val Glu Ala 100 105 . 110
- Ala Glu Glu Ala His Leu Lys His Glu Phe Asp Ala Asp Leu Gln Tyr 115 120 125
- Glu Tyr Phe Asn Ala Val Leu Ile Asn Glu Arg Asp Lys Asp Gly Asn 130 135 140
- Phe Leu Glu Leu Gly Lys Glu Phe Ile Leu Ala Pro Asn Asp His Phe 145 150 155 160
- Asn Asn Leu Pro Val Asn Ile Ser Leu Ser Asp Val Gln Val Pro Thr 165 170 175
- Asn Met Tyr Asn Lys Asp Pro Ala Ile Val Asn Gly Val Tyr Trp Ser 180 185 190
- Glu Ser Leu Asn Lys Val Phe Val Asp Asn Phe Asp Arg Asp Pro Ser 195 200 205
- Leu Ile Trp Gln Tyr Phe Gly Ser Ala Lys Gly Phe Phe Arg Gln Tyr 210 215 220
- Pro Gly Ile Lys Trp Glu Pro Asp Glu Asn Gly Val Ile Ala Phe Asp 225 230 235 240
- Cys Arg Asn Arg Lys Trp Tyr Ile Gln Ala Ala Thr Ser Pro Lys Asp 245 250 255
- Val Val Ile Leu Val Asp Val Ser Gly Ser Met Lys Gly Leu Arg Leu

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| Thr | Val | Ser | Ser | Ile | Leu | As |

sp Thr Leu Gly Asp Thr Ile Ala Lys Gln Asp Asp Phe Phe Asn Ile Ile Ala Tyr Asn Glu Glu Leu His Tyr Val Glu Pro Cys Leu Asn Gly Thr Leu Val Gln Ala Asp Arg Thr Asn Lys Glu His Phe Arg Glu His Leu Asp Lys Leu Phe Ala Lys Gly Ile Gly Met Leu Asp Ile Ala Leu Asn Glu Ala Phe Asn Ile Leu Ser Asp Phe Asn His Thr Gly Gln Gly Ser Ile Cys Ser Gln Ala Ile Met Leu Ile Thr Asp Gly Ala Val Asp Thr Tyr Asp Thr Ile Phe Ala Lys Tyr Asn Trp Pro Asp Arg Lys Val Arg Ile Phe Thr Tyr Leu Ile Gly Arg Glu Ala Ala Phe Ala Asp Asn Leu Lys Trp Met Ala Cys Ala Asn Lys Gly Phe Phe Thr Gln Ile Ser Thr Leu Ala Asp Val Gln Glu Asn Val Met Glu Tyr Leu His Val Leu Ser Arg Pro Lys Val Ile Asp Gln Glu His

Asp Val Val Trp Thr Glu Ala Tyr Ile Asp Ser Thr Leu Thr Asp Asp

Gln Gly Pro Val Leu Met Thr Thr Val Ala Met Pro Val Phe Ser Lys

Gln Asn Glu Thr Arg Ser Lys Gly Ile Leu Leu Gly Val Val Gly Thr

Asp Val Pro Val Lys Glu Leu Leu Lys Thr Ile Pro Lys Tyr Lys Leu

Gly Ile His Gly Tyr Ala Phe Ala Ile Thr Asn Asn Gly Tyr Ile Leu

| Thr | His 530 | Pro | Glu | Leu | Arg | Leu 535 | Leu | Tyr | Glu | Glu | Gly 540 | Lys | Lys | Arg | Arg |
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| Lys 545 | Pro | Asn | Tyr | Ser | Ser 550 | Val | Asp | Leu | Ser | Glu 555 | Val | Glu | Trp | Glu | Asp 560 |
| Arg | Asp | Asp | Val | Leu 565 | Arg | Asn | Ala | Met | Val 570 | Asn | Arg | Lys | Thr | Gly 575 | Lys |
| Phe | Ser | Met | Glu 580 | Val | Lys | Lys | Thr | Val 585 | Asp | Lys | Gly | Lys | Arg 590 | Val | Leu |
| Val | Met | Thr 595 | Asn | Asp | Tyr | Tyr | Tyr 600 | Thr | Asp | Ile | Lys | Gly 605 | Thr | Pro | Phe |
| Ser | Leu 610 | Gly | Val | Ala | Leu | Ser 615 | Arg | Gly | His | Gly | Lys 620 | Tyr | Phe | Phe | Arg |
| Gly 625 | Asn | Val | Thr | Ile | Glu 630 | Glu | Gly | Leu | His | Asp 635 | Leu | Glu | His | Pro | Asp 640 |
| Val | Ser | Leu | Ala | Asp 645 | Glu | Trp | Ser | Tyr | Cys 650 | Asn | Thr | Asp | Leu | His 655 | Pro |
| Glu | His | Arg | His 660 | Leu | Ser | Gln | Leu | Glu 665 | Ala | Ile | Lys | Leu | Tyr 670 | Leu | Lys |
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| Leu | Phe 690 | Asp | Ala | Val | Val | Ser 695 | Ala | Pro | Ile | Glu | Ala 700 | Tyr | Trp | Thr | Ser |
| Leu 705 | Ala | Leu | Asn | Lys | Ser 710 | Glu | Asn | Ser | Asp | Lys 715 | Gly | Val | Glu | Val | Ala 720 |
| Phe | Leu | Gly | Thr | Arg 725 | Thr | Gly | Leu | Ser | Arg 730 | Ile | Asn | Leu | Phe | Val 735 | Gly |
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| Asn | Ile | Phe 755 | Asn | Ala | Asp | His | Phe 760 | Pro | Leu | Trp | Tyr | Arg 765 | Arg | Ala | Ala |

Glu Gln Ile Pro Gly Ser Phe Val Tyr Ser Ile Pro Phe Ser Thr Gly

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- Glu Ile Arg Tyr Asn Glu Ser Leu Lys Cys Glu Arg Leu Lys Ala Gln

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<211> 912

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<213> Homo sapiens

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<212> DNA

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25

20

30

| Asp | Arg | Phe 35 | Pro | Leu | Trp | Tyr | Arg 40 | Gln | Ala | Ser | Glu | His 45 | Pro | Ala | Gly |
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| Ser | Phe 50 | Val | Phe | Asn | Leu | Arg 55 | Trp | Ala | Glu | Gly | Pro 60 | Glu | Ser | Ala | Gly |
| Glu 65 | Pro | Met | Val | Val | Thr 70 | Ala | Ser | Thr | Ala | Val 75 | Ala | Val | Thr | Val | Asp 80 |
| Lys | Arg | Thr | Ala | Ile 85 | Ala | Ala | Ala | Ala | Gly 90 | Val | Gln | Met | Lys | Leu 95 | Glu |
| Phe | Leu | Gln | Arg 100 | Lys | Phe | Trp | Ala | Ala 105 | Thr | Arg | Gln | Cys | Ser 110 | Thr | Val |
| Asp | Gly | Pro 115 | Cys | Thr | Gln | Ser | Cys 120 | Glu | Asp | Ser | Asp | Leu 125 | Asp | Cys | Phe |
| Val | Ile 130 | Asp | Asn | Asn | Gly | Phe 135 | Ile | Leu | Ile | Ser | Lys 140 | Arg | Ser | Arg | Glu |
| Thr 145 | Gly | Arg | Phe | Leu | Gly 150 | Glu | Val | Asp | Gly | Ala 155 | Val | Leu | Thr | Gln | Leu 160 |
| Leu | Ser | Met | Gly | Val 165 | Phe | Ser | Gln | Val | Thr 170 | Met | Tyr | Asp | Tyr | Gln 175 | Ala |
| Met | Cys | Lys | Pro 180 | Ser | Ser | His | His | His 185 | Ser | Ala | Ala | Gln | Pro 190 | Leu | Val |
| Ser | Pro | Ile 195 | Ser | Ala | Phe | Leu | Thr 200 | Ala | Thr | Arg | Trp | Leu 205 | Leu | Gln | Glu |
| Leu | Val 210 | Leu | Phe | Leu | Leu | Glu 215 | Trp | Ser | Val | Trp | Gly 220 | Ser | Trp | Tyr | Asp |
| Arg 225 | Gly | Ala | Glu | Ala | Lys 230 | Ser | Val | Phe | His | His 235 | Ser | His | Lys | His | Lys 240 |
| Lys | Gln | Asp | Pro | Leu 245 | Gln | Pro | Cys | Asp | Thr 250 | Glu | Tyr | Pro | Val | Phe 255 | Val |
| Tyr | Gln | Pro | Ala 260 | Ile | Arg | Glu | Ala | Asn 265 | Gly | Ile | Val | Glu | Cys 270 | Gly | Pro |
| Cys | Gln | Lys 275 | Val | Phe | Val | Val | Gln 280 | Gln | Ile | Pro | Asn | Ser 285 | Asn | Leu | Leu |

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<211> 323

<212> PRT

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Asp Arg Phe Pro Leu Trp Tyr Arg Gln Ala Ser Glu His Pro Ala Gly
35 40 45

Ser Phe Val Phe Asn Leu Arg Trp Ala Glu Gly Pro Glu Ser Ala Gly 50 55 60

Glu Pro Met Val Val Thr Ala Ser Thr Ala Val Ala Val Thr Val Asp
65 70 75 80

Lys Arg Thr Ala Ile Ala Ala Ala Gly Val Gln Met Lys Leu Glu 85 90 95

Phe Leu Gln Arg Lys Phe Trp Ala Ala Thr Arg Gln Cys Ser Thr Val 100 105 110

Asp Gly Pro Cys Thr Gln Ser Cys Glu Asp Ser Asp Leu Asp Cys Phe 115 120 125

Val Ile Asp Asn Asn Gly Phe Ile Leu Ile Ser Lys Arg Ser Arg Glu 130 135 140

Thr Gly Arg Phe Leu Gly Glu Val Asp Gly Ala Val Leu Thr Gln Leu 145 150 155 160

Leu Ser Met Gly Val Phe Ser Gln Val Thr Met Tyr Asp Tyr Gln Ala 165 170 175

Met Cys Lys Pro Ser Ser His His His Ser Ala Ala Gln Pro Leu Val 180 185 190 Ser Pro Ile Ser Ala Phe Leu Thr Ala Thr Arg Trp Leu Leu Gln Glu 195 200 205

Leu Val Leu Phe Leu Leu Glu Trp Ser Val Trp Gly Ser Trp Tyr Asp 210 215 220

Arg Gly Ala Glu Ala Lys Ser Val Phe His His Ser His Lys His Lys 225 230 235 240

Lys Gln Asp Pro Leu Gln Pro Cys Asp Thr Glu Tyr Pro Val Phe Val 245 250 255

Tyr Gln Pro Ala Ile Arg Glu Ala Asn Gly Ile Val Glu Cys Gly Pro 260 265 270

Cys Gln Lys Val Phe Val Val Gln Gln Ile Pro Asn Ser Asn Leu Leu 275 280 285

Leu Leu Val Thr Asp Pro Thr Cys Asp Cys Ser Ile Phe Pro Pro Val 290 295 300

Leu Gln Glu Ala Thr Glu Val Lys Tyr Asn Ala Ser Val Lys Cys Asp 305 310 315 320

Arg Met Arg

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<211> 350

<212> PRT

<213> Homo sapiens

<400> 18

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Asp Arg Lys Phe Leu Thr Pro Glu Asp Glu Ala Ser Val Phe Thr Leu 20 25 30

Asp Arg Phe Pro Leu Trp Tyr Arg Gln Ala Ser Glu His Pro Ala Gly
35 40 45

Ser Phe Val Phe Asn Leu Arg Trp Ala Glu Gly Pro Glu Ser Ala Gly 50 55 60

Glu Pro Met Val Val Thr Ala Ser Thr Ala Val Ala Val Thr Val Asp

| 65 | 70 | 75 | 80 |
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- Lys Arg Thr Ala Ile Ala Ala Ala Gly Val Gln Met Lys Leu Glu 85 90 95
- Phe Leu Gln Arg Lys Phe Trp Ala Ala Thr Arg Gln Cys Ser Thr Val 100 105 110
- Asp Gly Pro Cys Thr Gln Ser Cys Glu Asp Ser Asp Leu Asp Cys Phe 115 120 125
- Val Ile Asp Asn Asn Gly Phe Ile Leu Ile Ser Lys Arg Ser Arg Glu 130 135 140
- Thr Gly Arg Phe Leu Gly Glu Val Asp Gly Ala Val Leu Thr Gln Leu 145 150 155 160
- Leu Ser Met Gly Val Phe Ser Gln Val Thr Met Tyr Asp Tyr Gln Ala 165 170 175
- Met Cys Lys Pro Ser Ser His His His Ser Ala Ala Gln Pro Leu Val 180 185 190
- Ser Pro Ile Ser Ala Phe Leu Thr Ala Thr Arg Trp Leu Leu Gln Glu 195 200 205
- Leu Val Leu Phe Leu Leu Glu Trp Ser Val Trp Gly Ser Trp Tyr Asp 210 215 220
- Arg Gly Ala Glu Ala Lys Ser Val Phe His His Ser His Lys His Lys 225 230 235 240
- Lys Gln Asp Pro Leu Gln Pro Cys Asp Thr Glu Tyr Pro Val Phe Val 245 250 255
- Tyr Gln Pro Ala Ile Arg Glu Ala Asn Gly Ile Val Glu Cys Gly Pro 260 265 270
- Cys Gln Lys Val Phe Val Val Gln Gln Ile Pro Asn Ser Asn Leu Leu 275 280 285
- Leu Leu Val Thr Asp Pro Thr Cys Asp Cys Ser Ile Phe Pro Pro Val 290 295 300
- Leu Gln Glu Ala Thr Glu Val Lys Tyr Asn Ala Ser Val Lys Cys Asp 305 310 315 320
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| Leu | Tyr | Asp 275 | Val | Arg | Arg | Arg | Pro 280 | Trp | Tyr | Ile | Gln | Gly 285 | Ala | Ser | Ser |
| Pro | Lys 290 | Asp | Met | Val | Ile | Ile 295 | Val | Asp | Val | Ser | Gly 300 | Ser | Val | Ser | Gly |
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| Leu | Ser | Asp | Asp | Asp 325 | Tyr | Val | Asn | Val | Ala 330 | Ser | Phe | Asn | Glu | Lys 335 | Ala |
| Gln | Pro | Val | Ser 340 | Cys | Phe | Thr | His | Leu 345 | Val | Gln | Ala | Asn | Val 350 | Arg | Asn |
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Glu Met Phe His Lys Lys Ser Glu Ala Val Arg Arg Leu Val Glu Ala 100 105 110

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| Asn | Met | Tyr | Asn 180 | Lys | Asp | Pro | Ala | Ile 185 | Val | Asn | Gly | Val | Туг 190 | Trp | Ser |
| Glu | Ser | Leu 195 | Asn | Lys | Val | Phe | Val 200 | Asp | Asn | Phe | Asp | Arg 205 | Asp | Pro | Ser |
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| Thr | Ile | Ala 275 | Lys | Gln | Thr | Val | Ser 280 | Ser | Ile | Leu | Asp | Thr 285 | Leu | Gly | Asp |
| Asp | Asp 290 | Phe | Phe | Asn | Ile | Ile 295 | Ala | Tyr | Asn | Glu | Glu 300 | Leu | His | Tyr | Val |
| Glu 305 | Pro | Cys | Leu | Asn | Gly 310 | Thr | Leu | Val | Gln | Ala 315 | Asp | Arg | Thr | Asn | Lys 320 |
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| Trp 385 | Pro | Asp | Arg | Lys | Val 390 | Arg | Ile | Phe | Thr | Tyr 395 | Leu | Ile | Gly | Arg | Glu 400 |

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| Glu Tyr Leu Hi 435 | s Val Leu | Ser Arg 440 | Pro Lys | Val Ile | Asp Gln 445 | Glu His |
| Asp Val Val Tr 450 | p Thr Glu | Ala Tyr 455 | Ile Asp | Ser Thr 460 | Leu Thr | Asp Asp |
| Gln Gly Pro Va 465 | l Leu Met 470 | Thr Thr | Val Ala | Met Pro 475 | Val Phe | Ser Lys 480 |
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| Thr His Pro Gl 530 | u Leu Arg | Leu Leu 535 | Tyr Glu | Glu Gly 540 | Lys Lys | Arg Arg |
| Lys Pro Asn Ty 545 | r Ser Ser 550 | Val Asp | Leu Ser | Glu Val 555 | Glu Trp | Glu Asp 560 |
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| Phe Ser Met Gl 58 | _ | Lys Thr | Val Asp 585 | Lys Gly | Lys Arg 590 | Val Leu |
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| Ser Leu Gly Va 610 | l Ala Leu | Ser Arg 615 | Gly His | Gly Lys 620 | Tyr Phe | Phe Arg |
| Gly Asn Val Th | r Ile Glu 630 | Glu Gly | Leu His | Asp Leu 635 | Glu His | Pro Asp 640 |
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| Glu His | Arg | His 660 | Leu | Ser | Gln | Leu | Glu 665 | Ala | Ile | Lys | Leu | Tyr 670 | Leu | Lys |
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| Leu Asp | Glu | Arg | Lys 805 | Ser | Pro | Val | Val | Ala 810 | Ala | Val | Gly | Ile | Gln 815 | Met |
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| Leu | Tyr | Asp 275 | Val | Arg | Arg | Arg | Pro 280 | Trp | Tyr | Ile | Gln | Gly 285 | Ala | Ser | Ser |
| Pro | Lys | Asp | Met | Val | Ile | Ile | Val | Asp | Val | Ser | Gly | Ser | Val | Ser | Gly |

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Ala Asn Gly Tyr Val Phe Ala Ile Asp Leu Asn Gly Tyr Val Leu Leu

- His Pro Asn Leu Lys Pro Gln Thr Thr Asn Phe Arg Glu Pro Val Thr 565 570 575
- Leu Asp Phe Leu Asp Ala Glu Leu Glu Asp Glu Asn Lys Glu Glu Ile 580 585 590
- Arg Arg Ser Met Ile Asp Gly Asn Lys Gly His Lys Gln Ile Arg Thr 595 600 605
- Leu Val Lys Ser Leu Asp Glu Arg Tyr Ile Asp Glu Val Thr Arg Asn 610 615 620
- Tyr Thr Trp Val Pro Ile Arg Ser Thr Asn Tyr Ser Leu Gly Leu Val 625 630 635 640
- Leu Pro Pro Tyr Ser Thr Phe Tyr Leu Gln Ala Asn Leu Ser Asp Gln 645 650 655
- Ile Leu Gln Val Lys Tyr Phe Glu Phe Leu Leu Pro Ser Ser Phe Glu 660 665 670
- Ser Glu Gly His Val Phe Ile Ala Pro Arg Glu Tyr Cys Lys Asp Leu 675 680 685
- Asn Ala Ser Asp Asn Asn Thr Glu Phe Leu Lys Asn Phe Ile Glu Leu 690 695 700
- Met Glu Lys Val Thr Pro Asp Ser Lys Gln Cys Asn Asn Phe Leu Leu 705 710 .715 720
- His Asn Leu Ile Leu Asp Thr Gly Ile Thr Gln Gln Leu Val Glu Arg
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- Val Trp Arg Asp Gln Asp Leu Asn Thr Tyr Ser Leu Leu Ala Val Phe
 740 745 750
- Ala Ala Thr Asp Gly Gly Ile Thr Arg Val Phe Pro Asn Lys Ala Ala 755 760 765
- Glu Asp Trp Thr Glu Asn Pro Glu Pro Phe Asn Ala Ser Phe Tyr Arg 770 775 780
- Arg Ser Leu Asp Asn His Gly Tyr Val Phe Lys Pro Pro His Gln Asp 785 790 795 800
- Ala Leu Leu Arg Pro Leu Glu Leu Glu Asn Asp Thr Val Gly Ile Leu

- Val Ser Thr Ala Val Glu Leu Ser Leu Gly Arg Arg Thr Leu Arg Pro Ala Val Val Gly Val Lys Leu Asp Leu Glu Ala Trp Ala Glu Lys Phe Lys Val Leu Ala Ser Asn Arg Thr His Gln Asp Gln Pro Gln Lys Cys Gly Pro Asn Ser His Cys Glu Met Asp Cys Glu Val Asn Asn Glu Asp Leu Leu Cys Val Leu Ile Asp Asp Gly Gly Phe Leu Val Leu Ser Asn Gln Asn His Gln Trp Asp Gln Val Gly Arg Phe Phe Ser Glu Val Asp Ala Asn Leu Met Leu Ala Leu Tyr Asn Asn Ser Phe Tyr Thr Arg Lys Glu Ser Tyr Asp Tyr Gln Ala Ala Cys Ala Pro Gln Pro Pro Gly Asn Leu Gly Ala Ala Pro Arg Gly Val Phe Val Pro Thr Val Ala Asp Phe Leu Asn Leu Ala Trp Trp Thr Ser Ala Ala Ala Trp Ser Leu Phe Gln Gln Leu Leu Tyr Gly Leu Ile Tyr His Ser Trp Phe Gln Ala Asp Pro Ala Glu Ala Glu Gly Ser Pro Glu Thr Arg Glu Ser Ser Cys Val Met Lys Gln Thr Gln Tyr Tyr Phe Gly Ser Val Asn Ala Ser Tyr Asn Ala Ile Ile Asp Cys Gly Asn Cys Ser Arg Leu Phe His Ala Gln Arg Leu
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- Gln Cys Glu Ala Gly Arg Leu Leu Gln Lys Glu Thr His Cys Pro Ala

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Cys Gly Arg Gly Ala His His His His His His 1105 1110 1115

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Phe Gly Glu Ile Lys Ser Ile Ala Ala Lys Tyr Ser Gly Ser Gln 50 55 60

Leu Leu Gln Lys Lys Tyr Lys Glu Tyr Glu Lys Asp Val Ala Ile Glu 65 70 75 80

Glu Ile Asp Gly Leu Gln Leu Val Lys Lys Leu Ala Lys Ile Met Glu 85 90 95

Glu Met Phe His Lys Lys Ser Glu Ala Val Arg Arg Leu Val Glu Ala 100 105 110

Ala Glu Glu Ala His Leu Lys His Glu Phe Asp Ala Asp Leu Gln Tyr 115 120 125

Glu Tyr Phe Asn Ala Val Leu Ile Asn Glu Arg Asp Lys Asp Gly Asn 130 135 140

Phe Leu Glu Leu Gly Lys Glu Phe Ile Leu Ala Pro Asn Asp His Phe 145 150 155 160

Asn Asn Leu Pro Val Asn Ile Ser Leu Ser Asp Val Gln Val Pro Thr Asn Met Tyr Asn Lys Asp Pro Ala Ile Val Asn Gly Val Tyr Trp Ser Glu Ser Leu Asn Lys Val Phe Val Asp Asn Phe Asp Arg Asp Pro Ser Leu Ile Trp Gln Tyr Phe Gly Ser Ala Lys Gly Phe Phe Arg Gln Tyr Pro Gly Ile Lys Trp Glu Pro Asp Glu Asn Gly Val Ile Ala Phe Asp Cys Arg Asn Arg Lys Trp Tyr Ile Gln Ala Ala Thr Ser Pro Lys Asp Val Val Ile Leu Val Asp Val Ser Gly Ser Met Lys Gly Leu Arg Leu Thr Ile Ala Lys Gln Thr Val Ser Ser Ile Leu Asp Thr Leu Gly Asp Asp Asp Phe Phe Asn Ile Ile Thr Tyr Asn Glu Glu Leu His Tyr Val Glu Pro Cys Leu Asn Gly Thr Leu Val Gln Ala Asp Arg Thr Asn Lys Glu His Phe Arg Glu His Leu Asp Lys Leu Phe Ala Lys Gly Ile Gly Met Leu Asp Ile Ala Leu Asn Glu Ala Phe Asn Ile Leu Ser Asp Phe Asn His Thr Gly Gln Gly Ser Ile Cys Ser Gln Ala Ile Met Leu Ile Thr Asp Gly Ala Val Asp Thr Tyr Asp Thr Ile Phe Ala Lys Tyr Asn Trp Pro Asp Arg Lys Val Arg Ile Phe Thr Tyr Leu Ile Gly Arg Glu Ala Ala Phe Ala Asp Asn Leu Lys Trp Met Ala Cys Ala Asn Lys Gly

| Phe | Phe | Thr | Gln 420 | Ile | Ser | Thr | Leu | Ala 425 | Asp | Val | Gln | Glu | Asn 430 | Val | Met |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
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| Asp | Val 450 | Val | Trp | Thr | Glu | Ala 455 | Tyr | Ile | Asp | Ser | Thr 460 | Leu | Pro | Gln | Ala |
| Gln 465 | Lys | Leu | Ala | Asp | Asp 470 | Gln | Gly | Leu | Val | Leu 475 | Met | Thr | Thr | Val | Ala 480 |
| Met | Pro | Val | Phe | Ser 485 | Lys | Gln | Asn | Glu | Thr 490 | Arg | Ser | Lys | Gly | Ile 495 | Leu |
| Leu | Gly | Val | Val 500 | Gly | Thr | Asp | Val | Pro 505 | Val | Lys | Glu | Leu | Leu 510 | Lys | Thr |
| Ile | Pro | Lys 515 | Tyr | Lys | Leu | Gly | Ile 520 | His | Gly | Tyr | Ala | Phe 525 | Ala | Ile | Thr |
| Asn | Asn 530 | Gly | Tyr | Ile | Leu | Thr 535 | His | Pro | Glu | Leu | Arg 540 | Pro | Leu | Tyr | Glu |
| Glu 545 | Gly | Lys | Lys | Arg | Arg 550 | Lys | Pro | Asn | Tyr | Ser 555 | Ser | Val | Asp | Leu | Ser 560 |
| Glu | Val | Glu | Trp | Glu 565 | Asp | Arg | Asp | Asp | Val 570 | Leu | Arg | Asn | Ala | Met 575 | Val |
| Asn | Arg | Lys | Thr 580 | Gly | Lys | Phe | Ser | Met 585 | Glu | Val | Lys | Lys | Thr 590 | Val | Asp |
| Lys | Gly | Lys 595 | Arg | Val | Leu | Val | Met 600 | Thr | Asn | Asp | Tyr | Tyr 605 | Tyr | Thr | Asp |
| Ile | Lys 610 | Gly | Thr | Pro | Phe | Ser 615 | Leu | Gly | Val | Ala | Leu 620 | Ser | Arg | Gly | His |
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| Asp | Leu | Glu | His | Pro 645 | Asp | Val | Ser | Leu | Ala 650 | Asp | Glu | Trp | Ser | Tyr 655 | Cys |
| Asn | Thr | Asp | Leu 660 | His | Pro | Glu | His | Arg 665 | His | Leu | Ser | Gln | Leu 670 | Glu | Ala |

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Ser Ala Ala Lys Trp Ile Met Thr Glu Leu Val Leu Phe Leu Val Glu 930 935 940

Phe Asn Leu Cys Ser Trp Trp His Ser Asp Met Thr Ala Lys Ala Gln 945 950 955 960

Lys Leu Lys Gln Thr Leu Glu Pro Cys Asp Thr Glu Tyr Pro Ala Phe 965 970 975

Val Ser Glu Arg Thr Ile Lys Glu Thr Thr Gly Asn Ile Ala Cys Glu 980 985 990

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Phe Met Val Val Val Asp Ser Ser Cys Leu Cys Glu Ser Val Ala Pro 1010 1015 1020

Ile Thr Met Ala Pro Ile Glu Ile Arg Tyr Asn Glu Ser Leu Lys Cys 1025 1030 1035 1040

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His His His His His 1075

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Asp Asn Ser Arg Thr Pro Asn Lys Ile Asp Leu Tyr Asp Val Arg Arg

| Arg | Pro | Trp | Tyr | 11e 245 | Gln | Gly | Ala | Ala | Ser 250 | Pro | Lys | Asp | Met | Leu 255 | Ile |
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| Arg | Thr | Ser 275 | Val | Ser | Glu | Met | Leu 280 | Glu | Thr | Leu | Ser | Asp 285 | Asp | Asp | Phe |
| Val | Asn 290 | Val | Ala | Ser | Phe | Asn 295 | Ser | Asn | Ala | Gln | Asp 300 | Val | Ser | Cys | Phe |
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| Ala | Val | Asn | Asn | Ile 325 | Thr | Ala | Lys | Gly | Ile 330 | Thr | Asp | Tyr | Lys | Lys 335 | Gly |
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| Phe 385 | Thr | Phe | Ser | Val | Gly 390 | Gln | His | Asn | Tyr | Asp 395 | Arg | Gly | Pro | Ile | Gln 400 |
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| Gly | Ala | Ile | Arg 420 | Ile | Asn | Thr | Gln | Glu 425 | Tyr | Leu | Asp | Val | Leu 430 | Gly | Arg |
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| Val | Tyr 450 | | Asp | Ala | Leu | Glu 455 | | Gly | Leu | Val | Ile 460 | Thr | Gly | Thr | Leu |
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| Asn | Gln | Leu | Ile | Leu 485 | | Val | Met | Gly | Val 490 | | Val | Ser | Leu | Glu 495 | Asp |

| I | le | Lys | Arg | Leu 500 | Thr | Pro | Arg | Phe | Thr 505 | Leu | Cys | Pro | Asn | Gly 510 | Tyr | Tyr |
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| P | ro | Lys 530 | Asn | Pro | Lys | Ser | Gln 535 | Glu | Pro | Val | Thr | Leu 540 | Asp | Phe | Leu | Asp |
| | 1a 45 | Glu | Leu | Glu | Asn | Asp 550 | Ile | Lys | Val | Glu | Ile 555 | Arg | Asn | Lys | Met | Ile 560 |
| A | sp | Gly | Glu | Ser | Gly 565 | Glu | Lys | Thr | Phe | Arg 570 | Thr | Leu | Val | Lys | Ser 575 | Gln |
| A | sp | Glu | Arg | Tyr 580 | Ile | Asp | Lys | Gly | Asn 585 | Arg | Thr | Tyr | Thr | Trp 590 | Thr | Pro |
| V | al | Asn | Gly 595 | Thr | Asp | Tyr | Ser | Leu 600 | Ala | Leu | Val | Leu | Pro 605 | Thr | Tyr | Ser |
| P | he | Tyr 610 | Tyr | Ile | Lys | Ala | Lys 615 | Ile | Glu | Glu | Thr | Ile 620 | Thr | Gln | Ala | Arg |
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| P | he | Val | Val | Thr | Asp 725 | Gly | Gly | Ile | Thr | Arg 730 | Val | Tyr | Pro | Lys | Glu 735 | Ala |
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Gln Asp Leu Tyr Thr Val Glu Pro Asn Asn Ala Arg Gln Leu Val Glu 65 70 75 80

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Leu Val Arg Leu Ala Leu Glu Ala Glu Lys Val Gln Ala Ala His Gln
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Trp Arg Glu Asp Phe Ala Ser Asn Glu Val Val Tyr Tyr Asn Ala Lys 115 120 125

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| Tyr | Gln | His | Ala | Ala 165 | Val | His | Ile | Pro | Thr 170 | Asp | Ile | Tyr | Glu | Gly 175 | Ser |
| Thr | Ile | Val | Leu 180 | Asn | Glu | Leu | Asn | Trp 185 | Thr | Ser | Ala | Leu | Asp 190 | Glu | Val |
| Phe | Lys | Lys 195 | Asn | Arg | Glu | Glu | Asp 200 | Pro | Ser | Leu | Leu | Trp 205 | Gln | Val | Phe |
| Gly | Ser 210 | Ala | Thr | Gly | Leu | Ala 215 | Arg | Tyr | Tyr | Pro | Ala 220 | Ser | Pro | Trp | Val |
| Asp 225 | Asn | Ser | Arg | Thr | Pro 230 | Asn | Lys | Ile | Asp | Leu 235 | Tyr | Asp | Val | Arg | Arg 240 |
| Arg | Pro | Trp | Tyr | Ile 245 | Gln | Gly | Ala | Ala | Ser 250 | Pro | Lys | Asp | Met | Leu 255 | Ile |
| Leu | Val | Asp | Val 260 | Ser | Gly | Ser | Val | Ser 265 | Gly | Leu | Thr | Leu | Lys 270 | Leu | Ile |
| Arg | Thr | Ser 275 | Val | Ser | Glu | Met | Leu 280 | Glu | Thr | Leu | Ser | Asp 285 | Asp | Asp | Phe |
| Val | Asn 290 | Val | Ala | Ser | Phe | Asn 295 | Ser | Asn | Ala | Gln | Asp 300 | Val | Ser | Cys | Phe |
| Gln 305 | His | Leu | Val | Gln | Ala 310 | Asn | Val | Arg | Asn | Lys 315 | Lys | Val | Leu | Lys | Asp 320 |
| Ala | Val | Asn | Asn | Ile 325 | Thr | Ala | Lys | Gly | Ile 330 | Thr | Asp | Tyr | Lys | Lys 335 | Gly |
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| Asn | Cys | Asn 355 | Lys | Ile | Ile | Met | Leu 360 | Phe | Thr | Asp | Gly | Gly 365 | Glu | Glu | Arg |
| Ala | Gln 370 | | Ile | Phe | Ala | Lys 375 | | Asn | Lys | Asp | Lys 380 | Lys | Val | Arg | Val |

| Phe 385 | Thr | Phe | Ser | Val | Gly 390 | Gln | His | Asn | Tyr | Asp 395 | Arg | Gly | Pro | Ile | Gln 400 |
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| Gly | Ala | Ile | Arg 420 | Ile | Asn | Thr | Gln | Glu 425 | Tyr | Leu | Asp | Val | Leu 430 | Gly | Arg |
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| Val | Tyr 450 | Leu | Asp | Ala | Leu | Glu 455 | Leu | Gly | Leu | Val | Ile 460 | Thr | Gly | Thr | Leu |
| Pro 465 | Val | Phe | Asn | Ile | Thr 470 | Gly | Gln | Asn | Glu | Asn 475 | Lys | Thr | Asn | Leu | Lys 480 |
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| Phe | Ala | Ile 515 | Asp | Pro | Asn | Gly | Tyr 520 | Val | Leu | Leu | His | Pro 525 | Asn | Leu | Gln |
| Pro | Lys 530 | Asn | Pro | Lys | Ser | Gln 535 | Glu | Pro | Val | Thr | Leu 540 | Asp | Phe | Leu | Asp |
| Ala 545 | Glu | Leu | Glu | Asn | Asp 550 | Ile | Lys | Val | Glu | Ile 555 | Arg | Asn | Lys | Met | Ile 560 |
| Asp | Gly | Glu | Ser | Gly 565 | Glu | Lys | Thr | Phe | Arg 570 | Thr | Leu | Val | Lys | Ser 575 | Gln |
| Asp | Glu | Arg | Tyr 580 | Ile | Asp | Lys | Gly | Asn 585 | Arg | Thr | Tyr | Thr | Trp 590 | Thr | Pro |
| Val | Asn | Gly 595 | Thr | Asp | Tyr | Ser | Leu 600 | Ala | Leu | Val | Leu | Pro 605 | Thr | Tyr | Ser |
| Phe | Tyr 610 | Tyr | Ile | Lys | Ala | Lys 615 | Ile | Glu | Glu | Thr | Ile 620 | Thr | Gln | Ala | Arg |
| Ser 625 | _ | Lys | Gly | Lys | Met 630 | Lys | Asp | Ser | Glu | Thr 635 | Leu | Lys | Pro | Asp | Asn 640 |

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Ala Pro Lys Gln Gly Ala Gly His Arg Ser Ala Tyr Val Pro Ser Ile 900 905 910

Ala Asp Ile Leu His Ile Gly Trp Trp Ala Thr Ala Ala Ala Trp Ser 915 920 925

Ile Leu Gln Gln Phe Leu Leu Ser Leu Thr Phe Pro Arg Leu Leu Glu 930 935 940

Ala Val Glu Met Glu Asp Asp Asp Phe Thr Ala Ser Leu Ser Lys Gln 945 950 955 960

Ser Cys Ile Thr Glu Gln Thr Gln Tyr Phe Phe Asp Asn Asp Ser Lys 965 970 975

Ser Phe Ser Gly Val Leu Asp Cys Gly Asn Cys Ser Arg Ile Phe His 980 985 990

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Lys Gly Thr Cys Pro Cys Asp Thr Arg Leu 1010 1015

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<212> PRT

<213> Sus scrofa

<400> 35

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Ile Lys Ser Trp Val Asp Lys Met Gln Glu Asp Leu Val Thr Leu Ala 35 40 45

Lys Thr Ala Ser Gly Val Asn Gln Leu Val Asp Ile Tyr Glu Lys Tyr 50 55 60

Gln Asp Leu Tyr Thr Val Glu Pro Asn Asn Ala Arg Gln Leu Val Glu 65 70 75 80

Ile Ala Ala Arg Asp Ile Glu Lys Leu Leu Ser Asn Arg Ser Lys Ala

Leu Val Arg Leu Ala Leu Glu Ala Glu Lys Val Gln Ala Ala His Gln Trp Arg Glu Asp Phe Ala Ser Asn Glu Val Val Tyr Tyr Asn Ala Lys Asp Asp Leu Asp Pro Glu Lys Asn Asp Ser Glu Pro Gly Ser Gln Arg Ile Lys Pro Val Phe Ile Asp Asp Ala Asn Phe Gly Arg Gln Ile Ser Tyr Gln His Ala Ala Val His Ile Pro Thr Asp Ile Tyr Glu Gly Ser Thr Ile Val Leu Asn Glu Leu Asn Trp Thr Ser Ala Leu Asp Glu Val Phe Lys Lys Asn Arg Glu Glu Asp Pro Ser Leu Leu Trp Gln Val Phe Gly Ser Ala Thr Gly Leu Ala Arg Tyr Tyr Pro Ala Ser Pro Trp Val Asp Asn Ser Arg Thr Pro Asn Lys Ile Asp Leu Tyr Asp Val Arg Arg Arg Pro Trp Tyr Ile Gln Gly Ala Ala Ser Pro Lys Asp Met Leu Ile Leu Val Asp Val Ser Gly Ser Val Ser Gly Leu Thr Leu Lys Leu Ile Arg Thr Ser Val Ser Glu Met Leu Glu Thr Leu Ser Asp Asp Phe Val Asn Val Ala Ser Phe Asn Ser Asn Ala Gln Asp Val Ser Cys Phe Gln His Leu Val Gln Ala Asn Val Arg Asn Lys Lys Val Leu Lys Asp Ala Val Asn Asn Ile Thr Ala Lys Gly Ile Thr Asp Tyr Lys Lys Gly

Phe Ser Phe Ala Phe Glu Gln Leu Leu Asn Tyr Asn Val Ser Arg Ala

| Asn | Cys | Asn 355 | Lys | Ile | Ile | | Leu 360 | Phe | Thr | Asp | Gly | Gly 365 | Glu | Glu | Arg |
|-----|-----|------------|-----|-----|-----|-----|------------|-----|-----|-----|-----|------------|-----|-----|-----|
| Ala | Gln | Glu | Ile | Phe | Ala | Lys | Tyr | Asn | Lys | Asp | Lys | Lys | Val | Arg | Val |

- 370 375 380
- Phe Thr Phe Ser Val Gly Gln His Asn Tyr Asp Arg Gly Pro Ile Gln 385 390 395 400
- Trp Met Ala Cys Glu Asn Lys Gly Tyr Tyr Tyr Glu Ile Pro Ser Ile 405 410 415
- Gly Ala Ile Arg Ile Asn Thr Gln Glu Tyr Leu Asp Val Leu Gly Arg
 420 425 430
- Pro Met Val Leu Ala Gly Asp Lys Ala Lys Gln Val Gln Trp Thr Asn 435 440 445
- Val Tyr Leu Asp Ala Leu Glu Leu Gly Leu Val Ile Thr Gly Thr Leu 450 455 460
- Pro Val Phe Asn Ile Thr Gly Gln Asn Glu Asn Lys Thr Asn Leu Lys 465 470 475 480
- Asn Gln Leu Ile Leu Gly Val Met Gly Val Asp Val Ser Leu Glu Asp 485 490 495
- Ile Lys Arg Leu Thr Pro Arg Phe Thr Leu Cys Pro Asn Gly Tyr Tyr 500 505 510
- Phe Ala Ile Asp Pro Asn Gly Tyr Val Leu Leu His Pro Asn Leu Gln 515 520 525
- Pro Lys Asn Pro Lys Ser Gln Glu Pro Val Thr Leu Asp Phe Leu Asp 530 540
- Ala Glu Leu Glu Asn Asp Ile Lys Val Glu Ile Arg Asn Lys Met Ile
 545 550 555 560
- Asp Gly Glu Ser Gly Glu Lys Thr Phe Arg Thr Leu Val Lys Ser Gln 565 570 575
- Asp Glu Arg Tyr Ile Asp Lys Gly Asn Arg Thr Tyr Thr Trp Thr Pro 580 585 590
- Val Asn Gly Thr Asp Tyr Ser Leu Ala Leu Val Leu Pro Thr Tyr Ser

| 595 | 600 | 605 |
|-----|-----|-----|
| | | |

| Phe | Tyr 610 | Tyr | Ile | Lys | Ala | Lys 615 | Ile | Glu | Glu | Thr | Ile 620 | Thr | Gln | Ala | Arg |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Ser 625 | Lys | Lys | Gly | Lys | Met 630 | Lys | Asp | Ser | Glu | Thr 635 | Leu | Lys | Pro | Asp | Asn 640 |
| Phe | Glu | Glu | Ser | Gly 645 | Tyr | Thr | Phe | Ile | Ala 650 | Pro | Arg | Asp | Tyr | Cys 655 | Asn |
| Asp | Leu | Lys | Ile 660 | Ser | Asp | Asn | Asn | Thr 665 | Glu | Phe | Leu | Leu | Asn 670 | Phe | Asn |
| Glu | Phe | Ile 675 | Asp | Arg | Lys | Thr | Pro 680 | Asn | Asn | Pro | Ser | Cys 685 | Asn | Thr | Asp |
| Leu | Ile 690 | Asn | Arg | Val | Leu | Leu 695 | Asp | Ala | Gly | Phe | Thr 700 | Asn | Glu | Leu | Val |
| Gln 705 | Asn | Tyr | Trp | Ser | Lys 710 | Gln | Lys | Asn | Ile | Lys 715 | Gly | Val | Lys | Ala | Arg 720 |
| Phe | Val | Val | Thr | Asp 725 | Gly | Gly | Ile | Thr | Arg 730 | Val | Tyr | Pro | Lys | Glu 735 | Ala |
| Gly | Glu | Asn | Trp 740 | Gln | Glu | Asn | Pro | Glu 745 | Thr | Tyr | Glu | Asp | Ser 750 | Phe | Tyr |
| Lys | Arg | Ser 755 | Leu | Asp | Asn | Asp | Asn 760 | Tyr | Val | Phe | Thr | Ala 765 | Pro | Tyr | Phe |
| Asn | Lys 770 | Ser | Gly | Pro | Gly | Ala 775 | Tyr | Glu | Ser | Gly | Ile 780 | Met | Val | Ser | Lys |
| Al <u>a</u> 785 | Val | Glu | Ile | Tyr | Ile 790 | Gln | Gly | Lys | Leu | Leu 795 | Lys | Pro | Ala | Val | Val 800 |
| Gly | Ile | Lys | Ile | Asp 805 | Val | Asn | Ser | Trp | Ile 810 | Glu | Asn | Phe | Thr | Lys 815 | Thr |
| Ser | Ile | Arg | Asp 820 | Pro | Cys | Ala | Gly | Pro 825 | Val | Cys | Asp | Cys | Lys 830 | Arg | Asn |

Met Ala Asn His Asp Asp Tyr Thr Asn Gln Ile Gly Arg Phe Phe Gly

Ser Asp Val Met Asp Cys Val Ile Leu Asp Asp Gly Gly Phe Leu Leu

840

835

850 855 860

Glu Ile Asp Pro Ser Leu Met Arg His Leu Val Asn Ile Ser Val Tyr 865 870 875 880

Ala Phe Asn Lys Ser Tyr Asp Tyr Gln Ser Val Cys Glu Pro Gly Ala 885 890 895

Ala Pro Lys Gln Gly Ala Gly His Arg Ser Ala Tyr Val Pro Ser Ile 900 905 910

Ala Asp Ile Leu His Ile Gly Trp Trp Ala Thr Ala Ala Ala Trp Ser 915 920 925

Ile Leu Gln Gln Phe Leu Leu Ser Leu Thr Phe Pro Arg Leu Leu Glu 930 935 940

Ala Val Glu Met Glu Asp Asp Asp Phe Thr Ala Ser Leu Ser Lys Gln 945 950 955 960

Ser Cys Ile Thr Glu Gln Thr Gln Tyr Phe Phe Asp Asn Asp Ser Lys 965 970 975

Ser Phe Ser Gly Val Leu Asp Cys Gly Asn Cys Ser Arg Ile Phe His 980 985 990

Val Glu Lys Leu Met Asn Thr Asn Leu Ile Phe Ile Met Val Glu Ser 995 1000 1005

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<212> PRT

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Val Asn Val Ala Ser Phe Asn Ser Asn Ala Gln Asp Val Ser Cys Phe Gln His Leu Val Gln Ala Asn Val Arg Asn Lys Lys Val Leu Lys Asp Ala Val Asn Asn Ile Thr Ala Lys Gly Ile Thr Asp Tyr Lys Lys Gly Phe Ser Phe Ala Phe Glu Gln Leu Leu Asn Tyr Asn Val Ser Arg Ala Asn Cys Asn Lys Ile Ile Met Leu Phe Thr Asp Gly Glu Glu Arg Ala Gln Glu Ile Phe Ala Lys Tyr Asn Lys Asp Lys Lys Val Arg Val Phe Thr Phe Ser Val Gly Gln His Asn Tyr Asp Arg Gly Pro Ile Gln Trp Met Ala Cys Glu Asn Lys Gly Tyr Tyr Tyr Glu Ile Pro Ser Ile Gly Ala Ile Arq Ile Asn Thr Gln Glu Tyr Leu Asp Val Leu Gly Arg Pro Met Val Leu Ala Gly Asp Lys Ala Lys Gln Val Gln Trp Thr Asn Val Tyr Leu Asp Ala Leu Glu Leu Gly Leu Val Ile Thr Gly Thr Leu Pro Val Phe Asn Ile Thr Gly Gln Asn Glu Asn Lys Thr Asn Leu Lys Asn Gln Leu Ile Leu Gly Val Met Gly Val Asp Val Ser Leu Glu Asp Ile Lys Arg Leu Thr Pro Arg Phe Thr Leu Cys Pro Asn Gly Tyr Tyr Phe Ala Ile Asp Pro Asn Gly Tyr Val Leu Leu His Pro Asn Leu Gln Pro Lys Asn Pro Lys Ser Gln Glu Pro Val Thr Leu Asp Phe Leu Asp

| Ala 545 | Glu | Leu | Glu | Asn | Asp 550 | Ile | Lys | Val | Glu | 11e 555 | Arg | Asn | Lys | Met | 11e 560 |
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| Asp | Glu | Arg | Tyr 580 | Ile | Asp | Lys | Gly | Asn 585 | Arg | Thr | Tyr | Thr | Trp 590 | Thr | Pro |
| Val | Asn | Gly 595 | Thr | Asp | Tyr | Ser | Leu 600 | Ala | Leu | Val | Leu | Pro 605 | Thr | Tyr | Ser |
| Phe | Tyr 610 | Tyr | Ile | Lys | Ala | Lys 615 | Ile | Glu | Glu | Thr | Ile 620 | Thr | Gln | Ala | Arg |
| Ser 625 | Lys | Lys | Gly | Lys | Met 630 | Lys | Asp | Ser | Glu | Thr 635 | Leu | Lys | Pro | Asp | Asn 640 |
| Phe | Glu _, | Glu | Ser | Gly 645 | Tyr | Thr | Phe | Ile | Ala 650 | Pro | Arg | Asp | Tyr | Cys 655 | Asn |
| | | - | 660 | | Asp | | | 665 | | | | | 670 | | |
| | | 675 | _ | | Lys | | 680 | | | | | 685 | | | |
| | 690 | | | | Leu | 695 | | | | | 700 | | | | |
| 705 | | • | | | Lys 710 | | | | | 715 | | | | | 720 |
| | | ٠ | | 725 | Gly | | | | 730 | | | | | 735 | |
| | | | 740 | | Glu | | | 745 | | | | | 750 | | |
| | | 755 | | | Asn | | 760 | | | | | 765 | | | |
| | 770 | | | | Gly | 775 | | | | | 780 | | | | |
| Ala | | Glu | Ile | Tyr | Ile 790 | | Gly | Lys | Leu | Leu 795 | | Pro | Ala | val | Val 800 |

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Thr Asp Cys Gly Gly Val Ser 1060

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Ile Lys Ser Trp Val Asp Lys Met Gln Glu Asp Leu Val Thr Leu Ala 35 40 45

Lys Thr Ala Ser Gly Val Asn Gln Leu Val Asp Ile Tyr Glu Lys Tyr 50 55 60

Gln Asp Leu Tyr Thr Val Glu Pro Asn Asn Ala Arg Gln Leu Val Glu 65 70 75 80

Ile Ala Ala Arg Asp Ile Glu Lys Leu Leu Ser Asn Arg Ser Lys Ala 85 90 95

Leu Val Arg Leu Ala Leu Glu Ala Glu Lys Val Gln Ala Ala His Gln
100 105 110

Trp Arg Glu Asp Phe Ala Ser Asn Glu Val Val Tyr Tyr Asn Ala Lys
115 120 125

Asp Asp Leu Asp Pro Glu Lys Asn Asp Ser Glu Pro Gly Ser Gln Arg 130 135 140

Ile Lys Pro Val Phe Ile Asp Asp Ala Asn Phe Gly Arg Gln Ile Ser 145 150 155 160

Tyr Gln His Ala Ala Val His Ile Pro Thr Asp Ile Tyr Glu Gly Ser 165 170 175

Thr Ile Val Leu Asn Glu Leu Asn Trp Thr Ser Ala Leu Asp Glu Val 180 185 190

Phe Lys Lys Asn Arg Glu Glu Asp Pro Ser Leu Leu Trp Gln Val Phe 195 200 205 Gly Ser Ala Thr Gly Leu Ala Arg Tyr Tyr Pro Ala Ser Pro Trp Val Asp Asn Ser Arg Thr Pro Asn Lys Ile Asp Leu Tyr Asp Val Arg Arg Arg Pro Trp Tyr Ile Gln Gly Ala Ala Ser Pro Lys Asp Met Leu Ile Leu Val Asp Val Ser Gly Ser Val Ser Gly Leu Thr Leu Lys Leu Ile Arg Thr Ser Val Ser Glu Met Leu Glu Thr Leu Ser Asp Asp Phe Val Asn Val Ala Ser Phe Asn Ser Asn Ala Gln Asp Val Ser Cys Phe Gln His Leu Val Gln Ala Asn Val Arg Asn Lys Lys Val Leu Lys Asp Ala Val Asn Asn Ile Thr Ala Lys Gly Ile Thr Asp Tyr Lys Lys Gly Phe Ser Phe Ala Phe Glu Gln Leu Leu Asn Tyr Asn Val Ser Arg Ala Asn Cys Asn Lys Ile Ile Met Leu Phe Thr Asp Gly Glu Glu Arg Ala Gln Glu Ile Phe Ala Lys Tyr Asn Lys Asp Lys Lys Val Arg Val Phe Thr Phe Ser Val Gly Gln His Asn Tyr Asp Arg Gly Pro Ile Gln . 395 Trp Met Ala Cys Glu Asn Lys Gly Tyr Tyr Tyr Glu Ile Pro Ser Ile Gly Ala Ile Arg Ile Asn Thr Gln Glu Tyr Leu Asp Val Leu Gly Arg Pro Met Val Leu Ala Gly Asp Lys Ala Lys Gln Val Gln Trp Thr Asn Val Tyr Leu Asp Ala Leu Glu Leu Gly Leu Val Ile Thr Gly Thr Leu

| Pro 465 | Val | Phe | Asn | Ile | Thr 470 | Gly | Gln | Asn | Glu | Asn 475 | Lys | Thr | Asn | Leu | Lys 480 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
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| Ile | Lys | Arg | Leu 500 | Thr | Pro | Arg | Phe | Thr 505 | Leu | Cys | Pro | Asn | Gly 510 | Tyr | Tyr |
| Phe | Ala | Ile 515 | Asp | Pro | Asn | Gly | Tyr 520 | Val | Leu | Leu | His | Pro 525 | Asn | Leu | Gln |
| Pro | Lys 530 | Asn | Pro | Lys | Ser | Gln 535 | Glu | Pro | Val | Thr | Leu 540 | Asp | Phe | Leu | Asp |
| Ala 545 | Glu | Leu | Glu | Asn | Asp 550 | Ile | Lys | Val | Glu | Ile 555 | Arg | Asn | Lys | Met | Ile 560 |
| Asp | Gly | Glu | Ser | Gly 565 | Glu | Lys | Thr | Phe | Arg 570 | Thr | Leu | Val | Lys | Ser 575 | Gln |
| Asp | Glu | Arg | Tyr 580 | Ile | Asp | Lys | Gly | Asn 585 | Arg | Thr | Tyr | Thr | Trp 590 | Thr | Pro |
| Val | Asn | Gly 595 | Thr | Asp | Tyr | Ser | Leu 600 | Ala | Leu | Val | Leu | Pro 605 | Thr | Tyr | Ser |
| Phe | Tyr 610 | Tyr | Ile | Lys | Ala | Lys 615 | Ile | Glu | Glu | Thr | Ile 620 | Thr | Gln | Ala | Arg |
| Ser 625 | Lys | Lys | Gly | Lys | Met 630 | Lys | Asp | Ser | Glu | Thr 635 | Leu | Lys | Pro | Asp | Asn 640 |
| Phe | Glu | Glu | Ser | Gly 645 | Tyr | Thr | Phe | Ile | Ala 650 | Pro | Arg | Asp | Tyr | Cys 655 | Asn |
| Asp | Leu | Lys | Ile 660 | Ser | Asp | Asn | Asn | Thr 665 | Glu | Phe | Leu | Leu | Asn 670 | Phe | Asn |
| Glu | Phe | Ile 675 | Asp | Arg | Lys | Thr | Pro 680 | Asn | Asn | Pro | Ser | Cys 685 | Asn | Thr | Asp |
| Leu | Ile 690 | Asn | Arg | Val | Leu | Leu 695 | Asp | Ala | Gly | Phe | Thr 700 | Asn | Glu | Leu | Val |
| Gln 705 | Asn | Tyr | Trp | Ser | Lys 710 | Gln | Lys | Asn | Ile | Lys 715 | Gly | Val | Lys | Ala | Arg 720 |

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Ser Phe Ser Gly Val Leu Asp Cys Gly Asn Cys Ser Arg Ile Phe His 980 985 990

Val Glu Lys Leu Met Asn Thr Asn Leu Ile Phe Ile Met Val Glu Ser 995 1000 1005

Lys Gly Thr Cys Pro Cys Asp Thr Arg Leu Leu Ile Gln Ala Glu Gln 1010 1015 1020

Thr Ser Asp Gly Pro Asp Pro Cys Asp Met Val Lys Gln Pro Arg Tyr 1025 1030 1035 1040

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Lys Thr Ala Ser Gly Val Asn Gln Leu Val Asp Ile Tyr Glu Lys Tyr 50 55 60

Gln Asp Leu Tyr Thr Val Glu Pro Asn Asn Ala Arg Gln Leu Val Glu
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Ile Ala Arg Asp Ile Glu Lys Leu Leu Ser Asn Arg Ser Lys Ala 85 90 95

Leu Val Ser Leu Ala Leu Glu Ala Glu Lys Val Gln Ala Ala His Gln
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Trp Arg Glu Asp Phe Ala Ser Asn Glu Val Val Tyr Tyr Asn Ala Lys 115 120 125

Asp Asp Leu Asp Pro Glu Lys Asn Asp Ser Glu Pro Gly Ser Gln Arg 130 135 140

Tyr Gln His Ala Ala Val His Ile Pro Thr Asp Ile Tyr Glu Gly Ser 165 170 175

| Thr | Ile | Val | Leu 180 | Asn | Glu | Leu | Asn | Trp 185 | Thr | Ser | Ala | Leu | Asp 190 | Glu | Val |
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| Phe | Lys | Lys 195 | Asn | Arg | Glu | Glu | Asp 200 | Pro | Ser | Leu | Leu | Trp 205 | Gln | Val | Phe |
| Gly | Ser 210 | Ala | Thr | Gly | Leu | Ala 215 | Arg | Tyr | Tyr | Pro | Ala 220 | Ser | Pro | Trp | Val |
| Asp 225 | Asn | Ser | Arg | Thr | Pro 230 | Asn | Lys | Ile | Asp | Leu 235 | Tyr | Asp | Val | Arg | Arg 240 |
| Arg | Pro | Trp | Tyr | Ile 245 | Gln | Gly | Ala | Ala | Ser 250 | Pro | Lys | Asp | Met | Leu 255 | Ile |
| Leu | Val | Asp | Val 260 | Ser | Gly | Ser | Val | Ser 265 | Gly | Leu | Thr | Leu | Lys 270 | Leu | Ile |
| Arg | Thr | Ser 275 | Val | Ser | Glu | Met | Leu 280 | Glu | Thr | Leu | Ser | Asp 285 | Asp | Asp | Phe |
| Val | Asn 290 | Val | Ala | Ser | Phe | Asn 295 | Ser | Asn | Ala | Gln | Asp 300 | Val | Ser | Cys | Phe |
| Gln 305 | His | Leu | Val | Gln | Ala 310 | Asn | Val | Arg | Asn | Lys 315 | Lys | Val | Leu | Lys | Asp 320 |
| Ala | Val | Asn | Asn | Ile 325 | Thr | Ala | Lys | Gly | Ile 330 | Thr | Asp | Tyr | Lys | Lys 335 | Gly |
| Phe | Ser | Phe | Ala 340 | Phe | Glu | Gln | Leu | Leu 345 | Asn | Tyr | Asn | Val | Ser 350 | Arg | Ala |
| Asn | Cys | Asn 355 | Lys | Ile | Ile | Met | Leu 360 | Phe | Thr | Asp | Gly | Gly 365 | Glu | Glu | Arg |
| Ala | Gln 370 | Glu | Ile | Phe | Asn | Lys 375 | Tyr | Asn | Lys | Asp | Lys 380 | Lys | Val | Arg | Val |
| Phe 385 | Arg | Phe | Ser | Val | Gly 390 | Gln | His | Asn | Tyr | Glu 395 | Arg | Gly | Pro | Ile | Gln 400 |
| Trp | Met | Ala | Cys | Glu 405 | Asn | Lys | Gly | Tyr | Tyr 410 | Tyr | Glu | Ile | Pro | Ser 415 | Ile |
| Gly | Ala | Ile | Arg 420 | Ile | Asn | Thr | Gln | Glu 425 | Tyr | Leu | Asp | Val | Leu 430 | Gly | Arg |

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Leu Ile Asn Arg Val Leu Leu Asp Ala Gly Phe Thr Asn Glu Leu Val Gln Asn Tyr Trp Ser Lys Gln Lys Asn Ile Lys Gly Val Lys Ala Arg Phe Val Val Thr Asp Gly Gly Ile Thr Arg Val Tyr Pro Lys Glu Ala Gly Glu Asn Trp Gln Glu Asn Pro Glu Thr Tyr Glu Asp Ser Phe Tyr Lys Arg Ser Leu Asp Asn Asp Asn Tyr Val Phe Thr Ala Pro Tyr Phe Asn Lys Ser Gly Pro Gly Ala Tyr Glu Ser Gly Ile Met Val Ser Lys Ala Val Glu Ile Tyr Ile Gln Gly Lys Leu Leu Lys Pro Ala Val Val Gly Ile Lys Ile Asp Val Asn Ser Trp Ile Glu Asn Phe Thr Lys Thr Ser Ile Arg Asp Pro Cys Ala Gly Pro Val Cys Asp Cys Lys Arg Asn Ser Asp Val Met Asp Cys Val Ile Leu Asp Asp Gly Gly Phe Leu Leu Met Ala Asn His Asp Asp Tyr Thr Asn Gln Ile Gly Arg Phe Phe Gly Glu Ile Asp Pro Ser Leu Met Arg His Leu Val Asn Ile Ser Val Tyr Ala Phe Asn Lys Ser Tyr Asp Tyr Gln Ser Val Cys Glu Pro Gly Ala Ala Pro Lys Gln Gly Ala Gly His Arg Ser Ala Tyr Val Pro Ser Val Ala Asp Ile Leu Gln Ile Gly Trp Trp Ala Thr Ala Ala Ala Trp Ser Ile Leu Gln Gln Phe Leu Leu Ser Leu Thr Phe Pro Arg Leu Leu Glu

Ala Val Glu Met Glu Asp Asp Asp Phe Thr Ala Ser Leu Ser Lys Gln 945 950 955 960

Ser Cys Ile Thr Glu Gln Thr Gln Tyr Phe Phe Asp Asn Asp Ser Lys 965 970 975

Ser Phe Ser Gly Val Leu Asp Cys Gly Asn Cys Ser Arg Ile Phe His 980 985 990

Gly Glu Lys Leu Met Asn Thr Asn Leu Ile Phe Ile Met Val Glu Ser 995 1000 1005

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<213> Homo sapiens

<400> 42

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Lys Thr Ala Ser Gly Val Asn Gln Leu Val Asp Ile Tyr Glu Lys Tyr 50 55 60

Gln Asp Leu Tyr Thr Val Glu Pro Asn Asn Ala Arg Gln Leu Val Glu 65 70 75 80

Ile Ala Ala Arg Asp Ile Glu Lys Leu Leu Ser Asn Arg Ser Lys Ala 85 90 95

Leu Val Ser Leu Ala Leu Glu Ala Glu Lys Val Gln Ala Ala His Gln
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Trp Arg Glu Asp Phe Ala Ser Asn Glu Val Val Tyr Tyr Asn Ala Lys
115 120 125

Asp Asp Leu Asp Pro Glu Lys Asn Asp Ser Glu Pro Gly Ser Gln Arg 130 135 140

| Ile 145 | Lys | Pro | Val | Phe | Ile 150 | Glu | Asp | Ala | Asn | Phe 155 | Gly | Arg | Gln | Ile | Ser 160 |
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| Tyr | Gln | His | Ala | Ala 165 | Val | His | Ile | Pro | Thr 170 | Asp | Ile | Tyr | Glu | Gly 175 | Ser |
| Thr | Ile | Val | Leu 180 | Asn | Glu | Leu | Asn | Trp 185 | Thr | Ser | Ala | Leu | Asp 190 | Glu | Val |
| Phe | Lys | Lys 195 | Asn | Arg | Glu | Glu | Asp 200 | Pro | Ser | Leu | Leu | Trp 205 | Gln | Val | Phe |
| Gly | Ser 210 | Ala | Thr | Gly | Leu | Ala 215 | Arg | Tyr | Tyr | Pro | Ala 220 | Ser | Pro | Trp | Val |
| Asp 225 | Asn | Ser | Arg | Thr | Pro 230 | Asn | Lys | Ile | Asp | Leu 235 | Tyr | Asp | Val | Arg | Arg 240 |
| Arg | Pro | Trp | Tyr | Ile 245 | Gln | Gly | Ala | Ala | Ser 250 | Pro | Lys | Asp | Met | Leu 255 | Ile |
| Leu | Val | Asp | Val 260 | Ser | Gly | Ser | Val | Ser 265 | Gly | Leu | Thr | Leu | Lys 270 | Leu | Ile |
| Arg | Thr | Ser 275 | Val | Ser | Glu | Met | Leu 280 | Glu | Thr | Leu | Ser | Asp 285 | Asp | Asp | Phe |
| Val | Asn 290 | Val | Ala | Ser | Phe | Asn 295 | Ser | Asn | Ala | Gln | Asp 300 | Val | Ser | Cys | Phe |
| Gln 305 | His | Leu | Val | Gln | Ala 310 | Asn | Val | Arg | Asn | Lys 315 | Lys | Val | Leu | Lys | Asp 320 |
| Ala | Val | Asn | Asn | Ile 325 | Thr | Ala | Lys | Gly | Ile 330 | Thr | Asp | Tyr | Lys | Lys 335 | Gly |
| Phe | Ser | Phe | Ala 340 | Phe | Glu | Gln | Leu | Leu 345 | Asn | Tyr | Asn | Val | Ser 350 | Arg | Ala |
| Asn | Cys | Asn 355 | | Ile | Ile | Met | Leu 360 | Phe | Thr | Asp | Gly | Gly 365 | | Glu | Arg |
| Ala | Gln 370 | Glu | Ile | Phe | Asn | Lys 375 | | Asn | Lys | Asp | Lys 380 | Lys | Val | Arg | Val |
| Phe 385 | Arg | Phe | Ser | Val | Gly 390 | | His | Asn | Tyr | Glu 395 | | Gly | Pro | Ile | Gln 400 |

- Trp Met Ala Cys Glu Asn Lys Gly Tyr Tyr Tyr Glu Ile Pro Ser Ile
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 420 425 430
- Pro Met Val Leu Ala Gly Asp Lys Ala Lys Gln Val Gln Trp Thr Asn 435 440 445
- Val Tyr Leu Asp Ala Leu Glu Leu Gly Leu Val Ile Thr Gly Thr Leu 450 455 460
- Pro Val Phe Asn Ile Thr Gly Gln Phe Glu Asn Lys Thr Asn Leu Lys 465 470 475 480
- Asn Gln Leu Ile Leu Gly Val Met Gly Val Asp Val Ser Leu Glu Asp 485 490 495
- Ile Lys Arg Leu Thr Pro Arg Phe Thr Leu Cys Pro Asn Gly Tyr Tyr 500 505 510
- Phe Ala Ile Asp Pro Asn Gly Tyr Val Leu Leu His Pro Asn Leu Gln 515 520 525
- Pro Lys Asn Pro Lys Ser Gln Glu Pro Val Thr Leu Asp Phe Leu Asp 530 540
- Ala Glu Leu Glu Asn Asp Ile Lys Val Glu Ile Arg Asn Lys Met Ile 545 550 555 560
- Asp Gly Glu Ser Gly Glu Lys Thr Phe Arg Thr Leu Val Lys Ser Gln 565 570 575
- Asp Glu Arg Tyr Ile Asp Lys Gly Asn Arg Thr Tyr Thr Trp Thr Pro 580 585 590
- Val Asn Gly Thr Asp Tyr Ser Leu Ala Leu Val Leu Pro Thr Tyr Ser 595 600 605
- Phe Tyr Tyr Ile Lys Ala Lys Leu Glu Glu Thr Ile Thr Gln Ala Arg 610 615 620
- Ser Lys Lys Gly Lys Met Lys Asp Ser Glu Thr Leu Lys Pro Asp Asn 625 630 635 640
- Phe Glu Glu Ser Gly Tyr Thr Phe Ile Ala Pro Arg Asp Tyr Cys Asn 645 650 655

Asp Leu Lys Ile Ser Asp Asn Asn Thr Glu Phe Leu Leu Asn Phe Asn Glu Phe Ile Asp Arg Lys Thr Pro Asn Asn Pro Ser Cys Asn Ala Asp Leu Ile Asn Arg Val Leu Leu Asp Ala Gly Phe Thr Asn Glu Leu Val Gln Asn Tyr Trp Ser Lys Gln Lys Asn Ile Lys Gly Val Lys Ala Arg Phe Val Val Thr Asp Gly Gly Ile Thr Arg Val Tyr Pro Lys Glu Ala Gly Glu Asn Trp Gln Glu Asn Pro Glu Thr Tyr Glu Asp Ser Phe Tyr Lys Arg Ser Leu Asp Asn Asp Asn Tyr Val Phe Thr Ala Pro Tyr Phe Asn Lys Ser Gly Pro Gly Ala Tyr Glu Ser Gly Ile Met Val Ser Lys Ala Val Glu Ile Tyr Ile Gln Gly Lys Leu Leu Lys Pro Ala Val Val Gly Ile Lys Ile Asp Val Asn Ser Trp Ile Glu Asn Phe Thr Lys Thr Ser Ile Arg Asp Pro Cys Ala Gly Pro Val Cys Asp Cys Lys Arg Asn Ser Asp Val Met Asp Cys Val Ile Leu Asp Asp Gly Gly Phe Leu Leu Met Ala Asn His Asp Asp Tyr Thr Asn Gln Ile Gly Arg Phe Phe Gly Glu Ile Asp Pro Ser Leu Met Arg His Leu Val Asn Ile Ser Val Tyr Ala Phe Asn Lys Ser Tyr Asp Tyr Gln Ser Val Cys Glu Pro Gly Ala Ala Pro Lys Gln Gly Ala Gly His Arg Ser Ala Tyr Val Pro Ser Val

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Ile Leu Gln Gln Phe Leu Leu Ser Leu Thr Phe Pro Arg Leu Leu Glu 930 935 940

Ala Val Glu Met Glu Asp Asp Asp Phe Thr Ala Ser Leu Ser Lys Gln 945 950 955 960

Ser Cys Ile Thr Glu Gln Thr Gln Tyr Phe Phe Asp Asn Asp Ser Lys 965 970 975

Ser Phe Ser Gly Val Leu Asp Cys Gly Asn Cys Ser Arg Ile Phe His 980 985 990

Gly Glu Lys Leu Met Asn Thr Asn Leu Ile Phe Ile Met Val Glu Ser 995 1000 1005

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Thr Ser Asp Gly Pro Asn Pro Cys Asp Met Val Lys 1025 1030 1035

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Lys Thr Ala Ser Gly Val Asn Gln Leu Val Asp Ile Tyr Glu Lys Tyr 50 55 60

Gln Asp Leu Tyr Thr Val Glu Pro Asn Asn Ala Arg Gln Leu Val Glu 65 70 75 80

Ile Ala Ala Arg Asp Ile Glu Lys Leu Leu Ser Asn Arg Ser Lys Ala

| Leu | Val | Ser | Leu 100 | Ala | Leu | Glu | Ala | Glu 105 | Lys | Val | Gln | Ala | Ala 110 | His | Gln |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Trp | Arg | Glu 115 | Asp | Phe | Ala | Ser | Asn 120 | Glu | Val | Val | Tyr | Tyr 125 | Asn | Ala | Lys |
| Asp | Asp 130 | Leu | Asp | Pro | Glu | Lys 135 | Asn | Asp | Ser | Glu | Pro 140 | Gly | Ser | Gln | Arg |
| Ile 145 | Lys | Pro | Val | Phe | Ile 150 | Glu | Asp | Ala | Asn | Phe 155 | Gly | Arg | Gln | Ile | Ser 160 |
| Tyr | Gln | His | Ala | Ala 165 | Val | His | Ile | Pro | Thr 170 | Asp | Ile | Tyr | Glu | Gly 175 | Ser |
| Thr | Ile | Val | Leu 180 | Asn | Glu | Leu | Asn | Trp 185 | Thr | Ser | Ala | Leu | Asp 190 | Glu | Val |
| Phe | Lys | Lys 195 | Asn | Arg | Glu | Glu | Asp 200 | Pro | Ser | Leu | Leu | Trp 205 | Gln | Val | Phe |
| Gly | Ser 210 | Ala | Thr | Gly | Leu | Ala 215 | Arg | Tyr | Tyr | Pro | Ala 220 | Ser | Pro | Trp | Val |
| Asp 225 | Asn | Ser | Arg | Thr | Pro 230 | Asn | Lys | Ile | Asp | Leu 235 | Tyr | Asp | Val | Arg | Arg 240 |
| Arg | Pro | Trp | Tyr | Ile 245 | Gln | Gly | Ala | Ala | Ser 250 | Pro | Lys | Asp | Met | Leu 255 | Ile |
| Leu | Val | Asp | Val 260 | Ser | Gly | Ser | Val | Ser 265 | Gly | Leu | Thr | Leu | Lys 270 | Leu | Ile |
| Arg | Thr | Ser 275 | Val | Ser | Glu | Met | Leu 280 | Glu | Thr | Leu | Ser | Asp 285 | | Asp | Phe |
| Val | Asn 290 | Val | Ala | Ser | Phe | Asn 295 | | Asn | Ala | Gln | Asp 300 | | Ser | Cys | Phe |
| Gln 305 | | Leu | Val | Gln | Ala 310 | | Val | Arg | Asn | Lys 315 | | Val | Leu | Lys | Asp 320 |

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Ala Val Asn Asn Ile Thr Ala Lys Gly Ile Thr Asp Tyr Lys Lys Gly

- Asn Cys Asn Lys Ile Ile Met Leu Phe Thr Asp Gly Glu Glu Arg 355 360 365
- Ala Gln Glu Ile Phe Asn Lys Tyr Asn Lys Asp Lys Lys Val Arg Val 370 375 380
- Phe Arg Phe Ser Val Gly Gln His Asn Tyr Glu Arg Gly Pro Ile Gln 385 390 395 400
- Trp Met Ala Cys Glu Asn Lys Gly Tyr Tyr Tyr Glu Ile Pro Ser Ile
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- Gly Ala Ile Arg Ile Asn Thr Gln Glu Tyr Leu Asp Val Leu Gly Arg
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- Pro Met Val Leu Ala Gly Asp Lys Ala Lys Gln Val Gln Trp Thr Asn 435 440 445
- Val Tyr Leu Asp Ala Leu Glu Leu Gly Leu Val Ile Thr Gly Thr Leu 450 455 460
- Pro Val Phe Asn Ile Thr Gly Gln Phe Glu Asn Lys Thr Asn Leu Lys 465 470 475 480
- Asn Gln Leu Ile Leu Gly Val Met Gly Val Asp Val Ser Leu Glu Asp 485 490 495
- Ile Lys Arg Leu Thr Pro Arg Phe Thr Leu Cys Pro Asn Gly Tyr Tyr 500 505 510
- Phe Ala Ile Asp Pro Asn Gly Tyr Val Leu Leu His Pro Asn Leu Gln 515 520 525
- Pro Lys Asn Pro Lys Ser Gln Glu Pro Val Thr Leu Asp Phe Leu Asp 530 540
- Ala Glu Leu Glu Asn Asp Ile Lys Val Glu Ile Arg Asn Lys Met Ile 545 550 555 560
- Asp Gly Glu Ser Gly Glu Lys Thr Phe Arg Thr Leu Val Lys Ser Gln 565 570 575
- Asp Glu Arg Tyr Ile Asp Lys Gly Asn Arg Thr Tyr Thr Trp Thr Pro 580 585 590
- Val Asn Gly Thr Asp Tyr Ser Leu Ala Leu Val Leu Pro Thr Tyr Ser

| Phe | Tyr | Tyr | Ile | Lys | Ala | Lys | Leu | Glu | Glu | Thr | Ile | Thr | Gln |
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Ala Arg

Ser Lys Lys Gly Lys Met Lys Asp Ser Glu Thr Leu Lys Pro Asp Asn

Phe Glu Glu Ser Gly Tyr Thr Phe Ile Ala Pro Arg Asp Tyr Cys Asn

Asp Leu Lys Ile Ser Asp Asn Asn Thr Glu Phe Leu Leu Asn Phe Asn

Glu Phe Ile Asp Arg Lys Thr Pro Asn Asn Pro Ser Cys Asn Ala Asp

Leu Ile Asn Arg Val Leu Leu Asp Ala Gly Phe Thr Asn Glu Leu Val

Gln Asn Tyr Trp Ser Lys Gln Lys Asn Ile Lys Gly Val Lys Ala Arg

Phe Val Val Thr Asp Gly Gly Ile Thr Arg Val Tyr Pro Lys Glu Ala

Gly Glu Asn Trp Gln Glu Asn Pro Glu Thr Tyr Glu Asp Ser Phe Tyr

Lys Arg Ser Leu Asp Asn Asp Asn Tyr Val Phe Thr Ala Pro Tyr Phe

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Ala Val Glu Ile Tyr Ile Gln Gly Lys Leu Leu Lys Pro Ala Val Val

Gly Ile Lys Ile Asp Val Asn Ser Trp Ile Glu Asn Phe Thr Lys Thr

Ser Ile Arg Asp Pro Cys Ala Gly Pro Val Cys Asp Cys Lys Arg Asn

Ser Asp Val Met Asp Cys Val Ile Leu Asp Asp Gly Gly Phe Leu Leu

Met Ala Asn His Asp Asp Tyr Thr Asn Gln Ile Gly Arg Phe Phe Gly

Glu Ile Asp Pro Ser Leu Met Arg His Leu Val Asn Ile Ser Val Tyr 865 870 875 880

Ala Phe Asn Lys Ser Tyr Asp Tyr Gln Ser Val Cys Glu Pro Gly Ala 885 890 · 895

Ala Pro Lys Gln Gly Ala Gly His Arg Ser Ala Tyr Val Pro Ser Val 900 905 910

Ala Asp Ile Leu Gln Ile Gly Trp Trp Ala Thr Ala Ala Ala Trp Ser 915 920 925

Ile Leu Gln Gln Phe Leu Leu Ser Leu Thr Phe Pro Arg Leu Leu Glu 930 935 940

Ala Val Glu Met Glu Asp Asp Asp Phe Thr Ala Ser Leu Ser Lys Gln 945 950 955 960

Ser Cys Ile Thr Glu Gln Thr Gln Tyr Phe Phe Asp Asn Asp Ser Lys 965 970 975

Ser Phe Ser Gly Val Leu Asp Cys Gly Asn Cys Ser Arg Ile Phe His 980 985 990

Gly Glu Lys Leu Met Asn Thr Asn Leu Ile Phe Ile Met Val Glu Ser 995 1000 1005

Lys Gly Thr Cys Pro Cys Asp Thr Arg Leu Leu Ile Gln Ala Glu Gln 1010 1015 1020

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| Ile | Lys | Ser 35 | Trp | Val | Asp | Lys | Met 40 | Gln | Glu | Asp | Leu | Val 45 | Thr | Leu | Ala |
| Lys | Thr 50 | Ala | Ser | Gly | Val | Asn 55 | Gln | Leu | Val | Asp | Ile 60 | Tyr | Glu | Lys | Tyr |
| Gln 65 | Asp | Leu | Tyr | Thr | Val 70 | Glu | Pro | Asn | Asn | Ala 75 | Arg | Gln | Leu | Val | Glu 80 |
| Ile | Ala | Ala | Arg | Asp 85 | Ile | Glu | Lys | Leu | Leu 90 | Ser | Asn | Arg | Ser | Lys 95 | Ala |
| Leu | Val | Ser | Leu 100 | Ala | Leu | Glu | Ala | Glu 105 | Lys | Val | Gln | Ala | Ala 110 | His | Gln |
| Trp | Arg | Glu 115 | Asp | Phe | Ala | Ser | Asn 120 | Glu | Val | Val | Tyr | Tyr 125 | Asn | Ala | Lys |
| Asp | Asp 130 | Leu | Asp | Pro | Glu | Lys 135 | Asn | Asp | Ser | Glu | Pro 140 | Gly | Ser | Gln | Arg |
| Ile 145 | Lys | Pro | Val | Phe | Ile 150 | Glu | Asp | Ala | Asn | Phe 155 | Gly | Arg | Gln | Ile | Ser 160 |
| Tyr | Gln | His | Ala | Ala 165 | Val | His | Ile | Pro | Thr 170 | Asp | Ile | Tyr | Glu | Gly 175 | Ser |
| Thr | Ile | Val | Leu 180 | Asn | Glu | Leu | Asn | Trp 185 | Thr | Ser | Ala | Leu | Asp 190 | Glu | Val |
| Phe | Lys | Lys 195 | Asn | Arg | Glu | Glu | Asp 200 | Pro | Ser | Leu | Leu | Trp 205 | Gln | Val | Phe |
| Gly | Ser 210 | Ala | Thr | Gly | Leu | Ala 215 | Arg | Tyr | Tyr | Pro | Ala 220 | Ser | Pro | Trp | Val |
| Asp 225 | Asn | Ser | Arg | Thr | Pro 230 | Asn | Lys | Ile | Asp | Leu 235 | Tyr | Asp | Val | Arg | Arg 240 |
| Arg | Pro | Trp | Tyr | Ile 245 | Gln | Gly | Ala | Ala | Ser 250 | Pro | Lys | Asp | Met | Leu 255 | Ile |

Leu Val Asp Val Ser Gly Ser Val Ser Gly Leu Thr Leu Lys Leu Ile Arg Thr Ser Val Ser Glu Met Leu Glu Thr Leu Ser Asp Asp Phe Val Asn Val Ala Ser Phe Asn Ser Asn Ala Gln Asp Val Ser Cys Phe Gln His Leu Val Gln Ala Asn Val Arg Asn Lys Lys Val Leu Lys Asp Ala Val Asn Asn Ile Thr Ala Lys Gly Ile Thr Asp Tyr Lys Lys Gly Phe Ser Phe Ala Phe Glu Gln Leu Leu Asn Tyr Asn Val Ser Arg Ala Asn Cys Asn Lys Ile Ile Met Leu Phe Thr Asp Gly Gly Glu Glu Arg Ala Gln Glu Ile Phe Asn Lys Tyr Asn Lys Asp Lys Lys Val Arg Val Phe Arg Phe Ser Val Gly Gln His Asn Tyr Glu Arg Gly Pro Ile Gln Trp Met Ala Cys Glu Asn Lys Gly Tyr Tyr Tyr Glu Ile Pro Ser Ile Gly Ala Ile Arg Ile Asn Thr Gln Glu Tyr Leu Asp Val Leu Gly Arg Pro Met Val Leu Ala Gly Asp Lys Ala Lys Gln Val Gln Trp Thr Asn Val Tyr Leu Asp Ala Leu Glu Leu Gly Leu Val Ile Thr Gly Thr Leu Pro Val Phe Asn Ile Thr Gly Gln Phe Glu Asn Lys Thr Asn Leu Lys Asn Gln Leu Ile Leu Gly Val Met Gly Val Asp Val Ser Leu Glu Asp Ile Lys Arg Leu Thr Pro Arg Phe Thr Leu Cys Pro Asn Gly Tyr Tyr

Phe Ala Ile Asp Pro Asn Gly Tyr Val Leu Leu His Pro Asn Leu Gln Pro Lys Asn Pro Lys Ser Gln Glu Pro Val Thr Leu Asp Phe Leu Asp Ala Glu Leu Glu Asn Asp Ile Lys Val Glu Ile Arg Asn Lys Met Ile Asp Gly Glu Ser Gly Glu Lys Thr Phe Arg Thr Leu Val Lys Ser Gln Asp Glu Arg Tyr Ile Asp Lys Gly Asn Arg Thr Tyr Thr Trp Thr Pro Val Asn Gly Thr Asp Tyr Ser Leu Ala Leu Val Leu Pro Thr Tyr Ser Phe Tyr Tyr Ile Lys Ala Lys Leu Glu Glu Thr Ile Thr Gln Ala Arg Ser Lys Lys Gly Lys Met Lys Asp Ser Glu Thr Leu Lys Pro Asp Asn Phe Glu Glu Ser Gly Tyr Thr Phe Ile Ala Pro Arg Asp Tyr Cys Asn Asp Leu Lys Ile Ser Asp Asn Asn Thr Glu Phe Leu Leu Asn Phe Asn Glu Phe Ile Asp Arg Lys Thr Pro Asn Asn Pro Ser Cys Asn Ala Asp Leu Ile Asn Arg Val Leu Leu Asp Ala Gly Phe Thr Asn Glu Leu Val Gln Asn Tyr Trp Ser Lys Gln Lys Asn Ile Lys Gly Val Lys Ala Arg Phe Val Val Thr Asp Gly Gly Ile Thr Arg Val Tyr Pro Lys Glu Ala Gly Glu Asn Trp Gln Glu Asn Pro Glu Thr Tyr Glu Asp Ser Phe Tyr Lys Arg Ser Leu Asp Asn Asp Asn Tyr Val Phe Thr Ala Pro Tyr Phe

| Asn Lys 770 | Ser | Gly | Pro | Gly | Ala 775 | Tyr | Glu | Ser | Gly | Ile 780 | Met | Val | Ser | Lys |
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| Ala Val 785 | Glu | Ile | Tyr | Ile 790 | Gln | Gly | Lys | Leu | Leu 795 | Lys | Pro | Ala | Val | Val 800 |
| Gly Ile | Lys | Ile | Asp 805 | Val | Asn | Ser | Trp | Ile 810 | Glu | Asn | Phe | Thr | Lys 815 | Thr |
| Ser Ile | Arg | Asp 820 | Pro | Cys | Ala | Gly | Pro 825 | Val | Cys | Asp | Cys | Lys 830 | Arg | Asn |
| Ser Asp | Val 835 | Met | Asp | Cys | Val | Ile 840 | Leu | Asp | Asp | Gly | Gly 845 | Phe | Leu | Leu |
| Met Ala 850 | Asn | His | Asp | Asp | Tyr 855 | Thr | Asn | Gln | Ile | Gly 860 | Arg | Phe | Phe | Gly |
| Glu Ile 865 | Asp | Pro | Ser | Leu 870 | Met | Arg | His | Leu | Val 875 | Asn | Ile | Ser | Val | Tyr 880 |
| Ala Phe | Asn | Lys | Ser 885 | Tyr | Asp | Tyr | Gln | Ser 890 | Val | Cys | Glu | Pro | Gly 895 | Ala |
| Ala Pro | Lys | Gln 900 | Gly | Ala | Gly | His | Arg 905 | Ser | Ala | Tyr | Val | Pro 910 | Ser | Val |
| Ala Asp | Ile 915 | Leu | Gln | Ile | Gly | Trp 920 | Trp | Ala | Thr | Ala | Ala 925 | Ala | Trp | Ser |
| Ile Leu 930 | Gln | Gln | Phe | Leu | Leu 935 | Ser | Leu | Thr | Phe | Pro 940 | Arg | Leu | Leu | Glu |
| Ala Val 945 | Glu | Met | Glu | Asp 950 | Asp | Asp | Phe | Thr | Ala 955 | Ser | Leu | Ser | Lys | Gln 960 |
| Ser Cys | Ile | Thr | Glu 965 | Gln | Thr | Gln | Tyr | Phe 970 | Phe | Asp | Asn | Asp | Ser 975 | Lys |
| Ser Phe | Ser | Gly 980 | Val | Leu | Asp | Cys | Gly 985 | Asn | Cys | Ser | Arg | Ile 990 | Phe | His |
| Gly Glu | Lys 995 | Leu | Met | Asn | | Asn 1000 | Leu | Ile | Phe | | Met 1005 | Val | Glu | Ser |
| Lys Gly 1010 | Thr | Cys | Pro | | Asp 1015 | Thr | Arg | Leu | | Ile 1020 | Gln | Ala | Glu | Gln |

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Arg Lys Gly Pro Asp Val Cys Phe Asp Asn Asn Val Leu Glu Asp Tyr 1045 1050 1055

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Ala Trp Gly Gln Ala Lys Ile Pro Leu Glu Thr Val Lys Leu Trp Ala

Asp Thr Phe Gly Gly Asp Leu Tyr Asn Thr Val Thr Lys Tyr Ser Gly Ser Leu Leu Gln Lys Lys Tyr Lys Asp Val Glu Ser Ser Leu Lys Ile Glu Glu Val Asp Gly Leu Glu Leu Val Arg Lys Phe Ser Glu Asp Met Glu Asn Met Leu Arg Arg Lys Val Glu Ala Val Gln Asn Leu Val Glu Ala Ala Glu Glu Ala Asp Leu Asn His Glu Phe Asn Glu Ser Leu Val Phe Asp Tyr Tyr Asn Ser Val Leu Ile Asn Glu Arg Asp Glu Lys 160. Gly Asn Phe Val Glu Leu Gly Ala Glu Phe Leu Leu Glu Ser Asn Ala His Phe Ser Asn Leu Pro Val Asn Thr Ser Ile Ser Ser Val Gln Leu Pro Thr Asn Val Tyr Asn Lys Asp Pro Asp Ile Leu Asn Gly Val Tyr Met Ser Glu Ala Leu Asn Ala Val Phe Val Glu Asn Phe Gln Arg Asp Pro Thr Leu Thr Trp Gln Tyr Phe Gly Ser Ala Thr Gly Phe Phe Arg Ile Tyr Pro Gly Ile Lys Trp Thr Pro Asp Glu Asn Gly Val Ile Thr Phe Asp Cys Arg Asn Arg Gly Trp Tyr Ile Gln Ala Ala Thr Ser Pro Lys Asp Ile Val Ile Leu Val Asp Val Ser Gly Ser Met Lys Gly Leu Arg Met Thr Ile Ala Lys His Thr Ile Thr Thr Ile Leu Asp Thr Leu

Gly Glu Asn Asp Phe Val Asn Ile Ile Ala Tyr Asn Asp Tyr Val His

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| Val | Gly | Val 355 | Val | Asp | Gln | Ala | Leu 360 | Arg | Glu | Ala | Phe | Gln 365 | Ile | Leu | Lys |
| Gln | Phe 370 | Gln | Glu | Ala | Lys | Gln 375 | Gly | Ser | Leu | Cys | Asn 380 | Gln | Ala | Ile | Met |
| Leu 385 | Ile | Ser | Asp | Gly | Ala 390 | Val | Glu | Asp | Tyr | Glu 395 | Pro | Val | Phe | Glu | Lys 400 |
| Tyr | Asn | Trp | Pro | Asp 405 | Cys | Lys | Val | Arg | Val 410 | Phe | Thr | Tyr | Leu | Ile 415 | Gly |
| Arg | Glu | Val | Ser 420 | Phe | Ala | Asp | Arg | Met 425 | Lys | Trp | Ile | Ala | Cys 430 | Asn | Asn |
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| Val | Met 450 | Glu | Tyr | Leu | His | Val 455 | Leu | Ser | Arg | Pro | Met 460 | Val | Ile | Asn | His |
| Asp 465 | His | Asp | Ile | Ile | Trp 470 | Thr | Glu | Ala | Tyr | Met 475 | Asp | Ser | Lys | Leu | Leu 480 |
| Ser | Ser | Gln | Ala | Gln 485 | Ser | Leu | Thr | Leu | Leu 490 | | Thr | Val | Ala | Met 495 | Pro |
| Val | Phe | Ser | Lys 500 | Lys | Asn | Glu | Thr | Arg 505 | Ser | His | Gly | Ile | Leu 510 | Leu | Gly |
| Val | Val | Gly 515 | Ser | Asp | Val | Ala | Leu 520 | Arg | Glu | Leu | Met | Lys 525 | Leu | Ala | Pro |

Arg Tyr Lys Leu Gly Val His Gly Tyr Ala Phe Leu Asn Thr Asn Asn

Gly Tyr Ile Leu Ser His Pro Asp Leu Arg Pro Leu Tyr Arg Glu Gly

Lys Lys Leu Lys Pro Lys Pro Asn Tyr Asn Ser Val Asp Leu Ser Glu

| Val | Glu | Trp | Glu 580 | Asp | Gln | Ala | Glu | Ser 585 | Leu | Arg | Thr | Ala | Met 590 | Ile | Asn |
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| Gly | Lys 610 | Arg | Val | Leu | Phe | Leu 615 | Thr | Asn | Asp | Tyr | Phe 620 | Phe | Thr | Asp | Ile |
| Ser 625 | Asp | Thr | Pro | Phe | Ser 630 | Leu | Gly | Val | Val | Leu 635 | Ser | Arg | Gly | His | Gly 640 |
| Glu | Tyr | Ile | Leu | Leu 645 | Gly | Asn | Thr | Ser | Val 650 | Glu | Glu | Gly | Leu | His 655 | Asp |
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| Thr | Asp | Ile 675 | Asp | Pro | Asp | His | Arg 680 | Lys | Leu | Ser | Gln | Leu 685 | Glu | Ala | Met |
| Ile | Arg 690 | Phe | Leu | Thr | Arg | Lys 695 | Asp | Pro | Asp | Leu | Glu 700 | Cys | Asp | Glu | Glu |
| Leu 705 | Val | Arg | Glu | Val | Leu 710 | Phe | Asp | Ala | Val | Val 715 | Thr | Ala | Pro | Met | Glu 720 |
| Ala | Tyr | Trp | Thr | Ala 725 | | Ala | Leu | Asn | Met 730 | Ser | Glu | Glu | Ser | Glu 735 | His |
| Val | Val | Asp | Met 740 | Ala | Phe | Leu | Gly | Thr 745 | Arg | Ala | Gly | Leu | Leu 750 | Arg | Ser |
| Ser | Leu | Phe 755 | | Gly | Ser | Glu | Lys 760 | Val | Ser | Asp | Arg | Lys 765 | Phe | Leu | Thr |
| Pro | Glu 770 | | Glu | Ala | Ser | Val 775 | | Thr | Leu | Asp | Arg 780 | Phe | Pro | Leu | Trp |
| Tyr 785 | _ | Gln | Ala | Ser | Glu 790 | | Pro | Ala | Gly | Ser 795 | Phe | Val | Phe | Asn | Leu 800 |
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- Trp Ala Ala Thr Arg Gln Cys Ser Thr Val Asp Gly Pro Cys Thr Gln 850 855 860
- Ser Cys Glu Asp Ser Asp Leu Asp Cys Phe Val Ile Asp Asn Asn Gly 865 870 875 880
- Phe Ile Leu Ile Ser Lys Arg Ser Arg Glu Thr Gly Arg Phe Leu Gly 885 890 895
- Glu Val Asp Gly Ala Val Leu Thr Gln Leu Leu Ser Met Gly Val Phe 900 905 910
- Ser Gln Val Thr Met Tyr Asp Tyr Gln Ala Met Cys Lys Pro Ser Ser 915 920 925
- His His Ser Ala Ala Gln Pro Leu Val Ser Pro Ile Ser Ala Phe 930 935 940
- Leu Thr Ala Thr Arg Trp Leu Leu Gln Glu Leu Val Leu Phe Leu Leu 945 950 955 960
- Glu Trp Ser Val Trp Gly Ser Trp Tyr Asp Arg Gly Ala Glu Ala Lys 965 970 975
- Ser Val Phe His His Ser His Lys His Lys Lys Gln Asp Pro Leu Gln 980 985 990
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| Thr | Ser | Ala 35 | Leu | Leu | Trp | Leu | Leu 40 | Leu | Leu | Gly | Thr | Ser 45 | Leu | Ser | Pro |
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| Asp 65 | Thr | Phe | Gly | Gly | Asp 70 | Leu | Tyr | Asn | Thr | Val 75 | Thr | Lys | Tyr | Ser | Gly 80 |
| Ser | Leu | Leu | Leu | Gln 85 | Lys · | Lys | Tyr | Lys | Asp 90 | Val | Glu | Ser | Ser | Leu 95 | Lys |
| Ile | Glu | Glu | Val 100 | Asp | Gly | Leu | Glu | Leu 105 | Val | Arg | Lys | Phe | Ser 110 | Glu | Asp |
| Met | Glu | Asn 115 | Met | Leu | Arg | Arg | Lys 120 | Val | Glu | Ala | Val | Gln 125 | Asn | Leu | Val |
| Glu | Ala 130 | Ala | Glu | Glu | Ala | Asp 135 | Leu | Asn | His | Glu | Phe 140 | Asn | Glu | Ser | Leu |
| Val 145 | Phe | Asp | Tyr | Tyr | Asn 150 | Ser | Val | Leu | Ile | Asn 155 | Glu | Arg | Asp | Glu | Lys 160 |
| Gly | Asn | Phe | Val | Glu 165 | Leu | Gly | Ala | Glu | Phe 170 | Leu | Leu | Glu | Ser | Asn 175 | Ala |
| His | Phe | Ser | Asn 180 | Leu | Pro | Val | Asn | Thr 185 | | Ile | Ser | Ser | Val 190 | Gln | Leu |
| Pro | Thr | Asn 195 | Val | Tyr | Asn | Lys | Asp 200 | Pro | Asp | Ile | Leu | Asn 205 | Gly | Val | Tyr |
| Met | Ser 210 | Glu | Ala | Leu | Asn | Ala 215 | Val | Phe | Val | Glu | Asn 220 | Phe | Gln | Arg | Asp |

Pro Thr Leu Thr Trp Gln Tyr Phe Gly Ser Ala Thr Gly Phe Phe Arg

| Ile | Tyr | Pro | Gly | Ile 245 | Lys | Trp | Thr | Pro | Asp 250 | Glu | Asn | Gly | Val | Ile 255 | Thr |
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| Lys | s Asp | Ile 275 | Val | Ile | Leu | Val | Asp 280 | Val | Ser | Gly | Ser | Met 285 | Lys | Gly | Leu |
| Arg | 9 Met 290 | Thr | Ile | Ala | Lys | His 295 | Thr | Ile | Thr | Thr | Ile 300 | Leu | Asp | Thr | Leu |
| Gl ₃ | y Glu 5 | Asn | Asp | Phe | Val 310 | Asn | Ile | Ile | Ala | Tyr 315 | Asn | Asp | Tyr | Val | His 320 |
| Ту | : Ile | Glu | Pro | Cys 325 | Phe | Lys | Gly | Ile | Leu 330 | Val | Gln | Ala | Asp | Arg 335 | Asp |
| Ası | n Arg | Glu | His 340 | Phe | Lys | Leu | Leu | Val 345 | Glu | Glu | Leu | Met | Val 350 | Lys | Gly |
| Va. | l Gly | Val 355 | Val | Asp | Gln | Ala | Leu 360 | Arg | Glu | Ala | Phe | Gln 365 | Ile | Leu | Lys |
| Gl | n Phe 370 | Gln | Glu | Ala | Lys | Gln 375 | Gly | Ser | Leu | Cys | Asn 380 | Gln | Ala | Ile | Met |
| Le ¹ | ı Ile 5 | Ser | Asp | Gly | Ala 390 | Val | Glu | Asp | Tyr | Glu 395 | Pro | Val | Phe | Glu | Lys 400 |
| Тy | r Asn | Trp | Pro | Asp 405 | Cys | Lys | Val | Arg | Val 410 | Phe | Thr | Tyr | Leu | Ile 415 | Gly |
| Ar | g Glu | Val | Ser 420 | Phe | Ala | Asp | Arg | Met 425 | Lys | Trp | Ile | Ala | Cys 430 | Asn | Asn |
| Ly | s Gly | Tyr 435 | | Thr | Gln | Ile | Ser 440 | Thr | Leu | Ala | Asp | Thr 445 | Gln | Glu | Asn |
| Va | 1 Met 450 | | Tyr | Leu | His | Val 455 | | Ser | Arg | Pro | Met 460 | Val | Ile | Asn | His |
| As 46 | p His 5 | Asp | Ile | Ile | Trp 470 | | Glu | Ala | Tyr | Met 475 | | Ser | Lys | Leu | Leu 480 |
| Se | r Ser | Gln | Ala | Gln 485 | | Leu | Thr | Leu | Leu 490 | | Thr | Val | Ala | Met 495 | Pro |

| Val | Phe | Ser | Lys 500 | Lys | Asn | Glu | Thr | Arg 505 | Ser | His | Gly | Ile | Leu 510 | Leu | Gly |
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| Arg | Tyr 530 | Lys | Leu | Gly | Val | His 535 | Gly | Tyr | Ala | Phe | Leu 540 | Asn | Thr | Asn | Asn |
| Gly 545 | Tyr | Ile | Leu | Ser | His 550 | Pro | Asp | Leu | Arg | Pro 555 | Leu | Tyr | Arg | Glu | Gly 560 |
| Lys | Lys | Leu | Lys | Pro 565 | Lys | Pro | Asn | Tyr | Asn 570 | Ser | Val | Asp | Leu | Ser 575 | Glu |
| Val | Glu | Trp | Glu 580 | Asp | Gln | Ala | Glu | Ser 585 | Leu | Arg | Thr | Ala | Met 590 | Ile | Asn |
| Arg | Glu | Thr 595 | Gly | Thr | Leu | Ser | Met 600 | Asp | Val | Lys | Val | Pro 605 | Met | Asp | Lys |
| Gly | Lys 610 | Arg | Val | Leu | Phe | Leu 615 | Thr | Asn | Asp | Tyr | Phe 620 | Phe | Thr | Asp | Ile |
| Ser 625 | Asp | Thr | Pro | Phe | Ser 630 | Leu | Gly | Val | Val | Leu 635 | Ser | Arg | Gly | His | Gly 640 |
| Glu | Tyr | Ile | Leu | Leu 645 | Gly | Asn | Thr | Ser | Val 650 | Glu | Glu | Gly | Leu | His 655 | Asp |
| Leu | Leu | His | Pro 660 | Asp | Leu | Ala | Leu | Ala 665 | Gly | Asp | Trp | Ile | Tyr 670 | Cys | Ile |
| Thr | Asp | Ile 675 | Asp | Pro | Asp | His | Arg 680 | Lys | Leu | Ser | Gln | Leu 685 | Glu | Ala | Met |
| Ile | Arg 690 | Phe | Leu | Thr | Arg | Lys 695 | Asp | Pro | Asp | Leu | Glu 700 | Cys | Asp | Glu | Glu |
| Leu 705 | Val | Arg | Glu | Val | Leu 710 | Phe | Asp | Ala | Val | Val 715 | Thr | Ala | Pro | Met | Glu 720 |
| Ala | Tyr | Trp | Thr | Ala 725 | Leu | Ala | Leu | Asn | Met 730 | Ser | Glu | Glu | Ser | Glu 735 | His |
| Val | Val | Asp | Met 740 | | Phe | Leu | Gly | Thr 745 | Arg | Ala | Gly | Leu | Leu 750 | Arg | Ser |

Ser Leu Phe Val Gly Ser Glu Lys Val Ser Asp Arg Lys Phe Leu Thr 755 760 765

(

- Pro Glu Asp Glu Ala Ser Val Phe Thr Leu Asp Arg Phe Pro Leu Trp 770 775 780
- Tyr Arg Gln Ala Ser Glu His Pro Ala Gly Ser Phe Val Phe Asn Leu 785 790 795 800
- Arg Trp Ala Glu Gly Pro Glu Ser Ala Gly Glu Pro Met Val Val Thr 805 810 815
- Ala Ser Thr Ala Val Ala Val Thr Val Asp Lys Arg Thr Ala Ile Ala 820 825 830
- Ala Ala Gly Val Gln Met Lys Leu Glu Phe Leu Gln Arg Lys Phe 835 840 845
- Trp Ala Ala Thr Arg Gln Cys Ser Thr Val Asp Gly Pro Cys Thr Gln 850 855 860
- Ser Cys Glu Asp Ser Asp Leu Asp Cys Phe Val Ile Asp Asn Asn Gly 865 870 875 880
- Phe Ile Leu Ile Ser Lys Arg Ser Arg Glu Thr Gly Arg Phe Leu Gly 885 890 895
- Glu Val Asp Gly Ala Val Leu Thr Gln Leu Leu Ser Met Gly Val Phe 900 905 910
- Ser Gln Val Thr Met Tyr Asp Tyr Gln Ala Met Cys Lys Pro Ser Ser 915 920 925
- His His Ser Ala Ala Gln Pro Leu Val Ser Pro Ile Ser Ala Phe 930 935 940
- Leu Thr Ala Thr Arg Trp Leu Leu Gln Glu Leu Val Leu Phe Leu Leu 945 950 955 960
- Glu Trp Ser Val Trp Gly Ser Trp Tyr Asp Arg Gly Ala Glu Ala Lys 965 970 975
- Ser Val Phe His His Ser His Lys His Lys Lys Gln Asp Pro Leu Gln 980 985 990
- Pro Cys Asp Thr Glu Tyr Pro Val Phe Val Tyr Gln Pro Ala Ile Arg 995 1000 1005

Glu Ala Asn Gly Ile Val Glu Cys Gly Pro Cys Gln Lys Val Phe Val 1010 1015 1020

Val Gln Gln Ile Pro Asn Ser Asn Leu Leu Leu Leu Val Thr Asp Pro 1025 1030 1035 1040

Thr Cys Asp Cys Ser Ile Phe Pro Pro Val Leu Gln Glu Ala Thr Glu 1045 1050 1055

Val Lys Tyr Asn Ala Ser Val Lys Cys Asp Arg Met Arg 1060 1065

<210> 55

<211> 1097

<212> PRT

<213> Homo sapiens

<400> 55

Met Pro Ala Thr Pro Asn Phe Leu Ala Asn Pro Ser Ser Ser Arg
1 5 10 15

Trp Ile Pro Leu Gln Pro Met Pro Val Ala Trp Ala Phe Val Gln Lys
20 25 30

Thr Ser Ala Leu Leu Trp Leu Leu Leu Leu Gly Thr Ser Leu Ser Pro 35 40 45

Ala Trp Gly Gln Ala Lys Ile Pro Leu Glu Thr Val Lys Leu Trp Ala 50 55 60

Asp Thr Phe Gly Gly Asp Leu Tyr Asn Thr Val Thr Lys Tyr Ser Gly 65 70 75 80

Ser Leu Leu Gln Lys Lys Tyr Lys Asp Val Glu Ser Ser Leu Lys 85 90 95

Ile Glu Glu Val Asp Gly Leu Glu Leu Val Arg Lys Phe Ser Glu Asp 100 105 110

Met Glu Asn Met Leu Arg Arg Lys Val Glu Ala Val Gln Asn Leu Val 115 120 125

Glu Ala Ala Glu Glu Ala Asp Leu Asn His Glu Phe Asn Glu Ser Leu 130 135 140

Val Phe Asp Tyr Tyr Asn Ser Val Leu Ile Asn Glu Arg Asp Glu Lys
145 150 155 160

| Gly | Asn | Phe | Val | Glu 165 | Leu | Gly | Ala | Glu | Phe 170 | Leu | Leu | Glu | Ser | Asn 175 | Ala |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| His | Phe | Ser | Asn 180 | Leu | Pro | Val | Asn | Thr 185 | Ser | Ile | Ser | Ser | Val 190 | Gln | Leu |
| Pro | Thr | Asn 195 | Val | Tyr | Asn | Lys | Asp 200 | Pro | Asp | Ile | Leu | Asn 205 | Gly | Val | Tyr |
| Met | Ser 210 | Glu | Ala | Leu | Asn | Ala 215 | Val | Phe | Val | Glu | Asn 220 | Phe | Gln | Arg | Asp |
| Pro 225 | Thr | Leu | Thr | Trp | Gln 230 | Tyr | Phe | Gly | Ser | Ala 235 | Thr | Gly | Phe | Phe | Arg 240 |
| Ile | Tyr | Pro | Gly | Ile 245 | Lys | Trp | Thr | Pro | Asp 250 | Glu | Asn | Gly | Val | Ile 255 | Thr |
| Phe | Asp | Cys | Arg 260 | Asn | Arg | Gly | Trp | Tyr 265 | Ile | Gln | Ala | Ala | Thr 270 | Ser | Pro |
| Lys | Asp | Ile 275 | Val | Ile | Leu | Val | Asp 280 | Val | Ser | Gly | Ser | Met 285 | Lys | Gly | Leu |
| Arg | Met 290 | Thr | Ile | Ala | Lys | His 295 | Thr | Ile | Thr | Thr | Ile 300 | Leu | Asp | Thr | Leu |
| Gly 305 | | Asn | Asp | Phe | Val 310 | Asn | Ile | Ile | Ala | Tyr 315 | Asn | Asp | Tyr | Val | His 320 |
| Tyr | Ile | Glu | Pro | Cys 325 | Phe | Lys | Gly | Ile | Leu 330 | Val | Gln | Ala | Asp | Arg 335 | Asp |
| Asn | Arg | Glu | His 340 | Phe | Lys | Leu | Leu | Val 345 | | Glu | Leu | Met | Val 350 | Lys | Gly |
| Val | Gly | Val 355 | | Asp | Gln | Ala | Leu 360 | | Glu | Ala | Phe | Gln 365 | | Leu | Lys |
| Gln | Phe 370 | | Glu | Ala | Lys | Gln 375 | | Ser | Leu | Cys | Asn 380 | | Ala | Ile | Met |
| Leu 385 | | Ser | Asp | Gly | Ala 390 | | Glu | Asp | Tyr | Glu 395 | | Val | Phe | Glu | Lys 400 |
| Tyr | Asn | Trp | Pro | Asp 405 | | Lys | Val | Arg | Val 410 | | Thr | Tyr | Leu | Ile 415 | Gly |

- Lys Gly Tyr Tyr Thr Gln Ile Ser Thr Leu Ala Asp Thr Gln Glu Asn 435 440 445
- Val Met Glu Tyr Leu His Val Leu Ser Arg Pro Met Val Ile Asn His 450 455 460
- Asp His Asp Ile Ile Trp Thr Glu Ala Tyr Met Asp Ser Lys Leu Leu 465 470 475 480
- Ser Ser Gln Ala Gln Ser Leu Thr Leu Leu Thr Thr Val Ala Met Pro 485 490 495
- Val Phe Ser Lys Lys Asn Glu Thr Arg Ser His Gly Ile Leu Leu Gly 500 505 510
- Val Val Gly Ser Asp Val Ala Leu Arg Glu Leu Met Lys Leu Ala Pro 515 520 525
- Arg Tyr Lys Leu Gly Val His Gly Tyr Ala Phe Leu Asn Thr Asn Asn 530 535 540
- Gly Tyr Ile Leu Ser His Pro Asp Leu Arg Pro Leu Tyr Arg Glu Gly 545 550 555 560
- Lys Lys Leu Lys Pro Lys Pro Asn Tyr Asn Ser Val Asp Leu Ser Glu 565 570 575
- Val Glu Trp Glu Asp Gln Ala Glu Ser Leu Arg Thr Ala Met Ile Asn 580 585 590
- Arg Glu Thr Gly Thr Leu Ser Met Asp Val Lys Val Pro Met Asp Lys 595 600 605
- Gly Lys Arg Val Leu Phe Leu Thr Asn Asp Tyr Phe Phe Thr Asp Ile 610 615 620
- Ser Asp Thr Pro Phe Ser Leu Gly Val Val Leu Ser Arg Gly His Gly 625 630 635 640
- Glu Tyr Ile Leu Cly Asn Thr Ser Val Glu Glu Gly Leu His Asp 645 650 655
- Leu Leu His Pro Asp Leu Ala Leu Ala Gly Asp Trp Ile Tyr Cys Ile 660 665 670

Thr Asp Ile Asp Pro Asp His Arg Lys Leu Ser Gln Leu Glu Ala Met Ile Arg Phe Leu Thr Arg Lys Asp Pro Asp Leu Glu Cys Asp Glu Glu Leu Val Arg Glu Val Leu Phe Asp Ala Val Val Thr Ala Pro Met Glu Ala Tyr Trp Thr Ala Leu Ala Leu Asn Met Ser Glu Glu Ser Glu His Val Val Asp Met Ala Phe Leu Gly Thr Arg Ala Ser Gly Leu Leu Arg Ser Ser Leu Phe Val Gly Ser Glu Lys Val Ser Asp Arg Lys Phe Leu Thr Pro Glu Asp Glu Ala Ser Val Phe Thr Leu Asp Arg Phe Pro Leu Trp Tyr Arg Gln Ala Ser Glu His Pro Ala Gly Ser Phe Val Phe Asn Leu Arg Trp Ala Glu Gly Pro Glu Ser Ala Gly Glu Pro Met Val Val Thr Ala Ser Thr Ala Val Ala Val Thr Val Asp Lys Arg Thr Ala Ile Ala Ala Ala Gly Val Gln Met Lys Leu Glu Phe Leu Gln Arg Lys Phe Trp Ala Ala Thr Arg Gln Cys Ser Thr Val Asp Gly Pro Cys Thr Gln Ser Cys Glu Asp Ser Asp Leu Asp Cys Phe Val Ile Asp Asn Asn Gly Phe Ile Leu Ile Ser Lys Arg Ser Arg Glu Thr Gly Arg Phe Leu Gly Glu Val Asp Gly Ala Val Leu Thr Gln Leu Leu Ser Met Gly Val Phe Ser Gln Val Thr Met Tyr Asp Tyr Gln Ala Met Cys Lys Pro Ser

- Ser His His Ser Ala Ala Gln Pro Leu Val Ser Pro Ile Ser Ala 930 935 940
- Phe Leu Thr Ala Thr Arg Trp Leu Leu Gln Glu Leu Val Leu Phe Leu 945 950 955 960
- Leu Glu Trp Ser Val Trp Gly Ser Trp Tyr Asp Arg Gly Ala Glu Ala 965 970 975
- Lys Ser Val Phe His His Ser His Lys His Lys Gln Asp Pro Leu 980 985 990
- Gln Pro Cys Asp Thr Glu Tyr Pro Val Phe Val Tyr Gln Pro Ala Ile 995 1000 1005
- Arg Glu Ala Asn Gly Ile Val Glu Cys Gly Pro Cys Gln Lys Val Phe 1010 1015 1020
- Val Val Gln Gln Ile Pro Asn Ser Asn Leu Leu Leu Leu Val Thr Asp 1025 1030 1035 1040
- Pro Thr Cys Asp Cys Ser Ile Phe Pro Pro Val Leu Gln Glu Ala Thr 1045 1050 1055
- Glu Val Lys Tyr Asn Ala Ser Val Lys Cys Asp Arg Met Arg Ser Gln 1060 1065 1070
- Lys Leu Arg Arg Pro Asp Ser Cys His Ala Phe His Pro Glu Glu 1075 1080 1085
- Asn Ala Gln Asp Cys Gly Gly Ala Ser 1090 1095